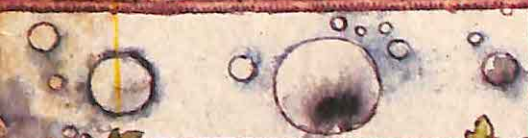


# DISCOVERING SCIENCE 3





# DISCOVERING SCIENCE

## BOOK 3

GOMATHI KRISHNAMACHARI

Vidya Mandir Higher Secondary School  
Madras

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Delhi

Illustrations: LALITHA



**Sangam Books**

## NOTE TO THE TEACHER

In the course of writing these books, some decisions have been taken with the recognition that this is a course for the primary level. The terminology and vocabulary must therefore be exact without emotionally distancing the young learner.

With this in mind, some of the vocabulary is 'phased out', e.g. Book 1 uses the term *he-frog* and *she-frog*, and Book 3 introduces the words *male* and *female*.

The teacher's attention is also drawn to the fact that for some plants, fruits and vegetables, the *most* familiar names have been used since there are regional variations. It seemed appropriate, for instance to say *lady's fingers* and *brinjal* instead of *okra* or *aubergine*. Wherever necessary, the teacher is advised to substitute words that are better understood for such words. However, it is also recommended that 'internationally' understood words are introduced at the appropriate level so that they pass into the learner's passive vocabulary.

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## PREFACE

*Discovering Science* offers a new and challenging set of texts which has grown out of modern approaches to learning and teaching science. The five books in the primary series are based chiefly on the syllabus and recommendations of the National Council of Educational Research and Training (NCERT). The books also take into account the syllabuses of other primary-school systems.

The series presents science as the logical, exact discipline it is. The concepts of interdependence and of cause-effect in natural phenomena are clearly established. In the text, as in the exercises, science emerges as knowledge bound up closely with everyday life. A sense of ecology is also developed in a simple manner.

The texts are profusely illustrated, and are planned with a view to stimulating the child's interest and curiosity. The exercises should serve not only to recapitulate what has been learnt, but to create lines for thinking, interpretation, deduction, classification — all of these appropriate to the age-level. Due account has been taken of the possibilities and limitations of the classroom.

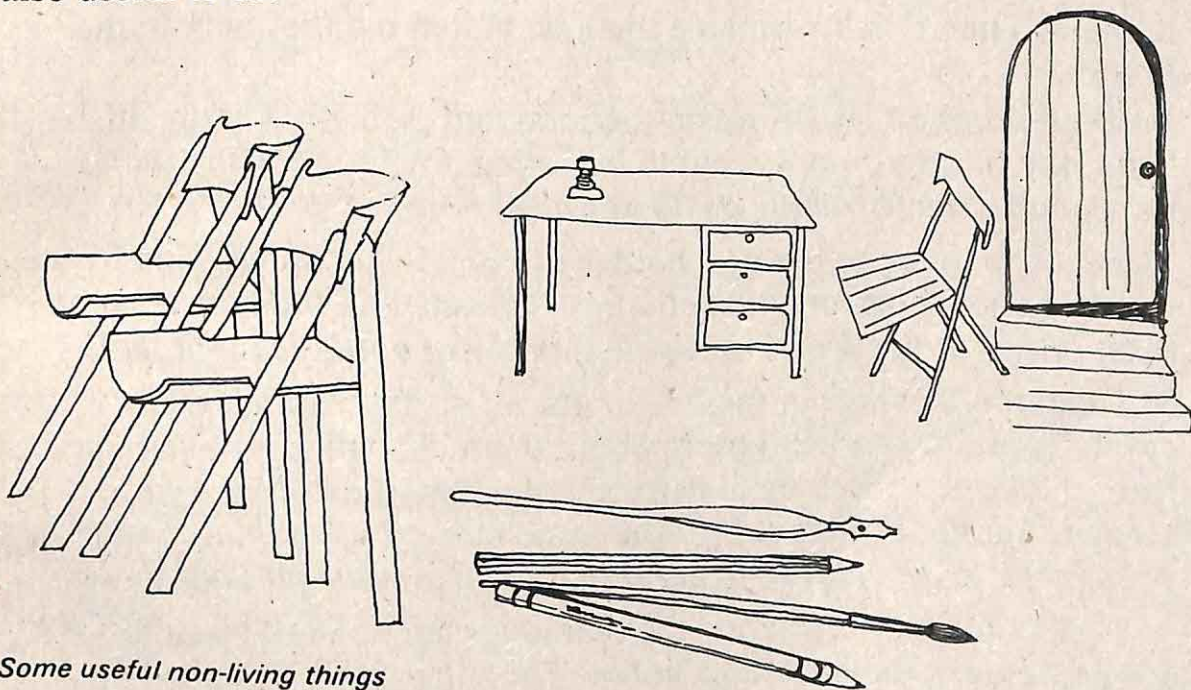
The authors and publishers are grateful to the many teachers consulted in the preparation of the books. They are likewise grateful to the artists who have designed and illustrated the books.



# 1. Living things : their help to mankind

What are living things?

We make use of a number of things everyday. We see them all the time. Some of these useful things such as plants and animals are living things. Non-living things such as pens, pencils, desks and chairs are also useful to us.



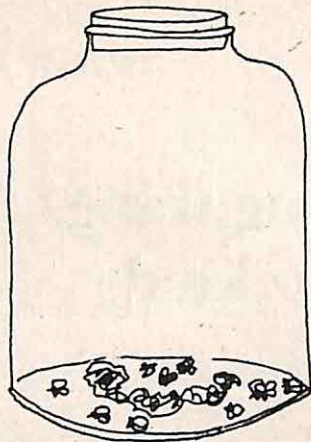
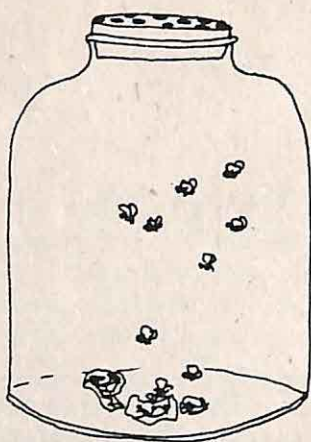
*Some useful non-living things*

Look at the pictures of some of the things which are useful to us. It is easy to make out which of them are living and which of them are non-living, because living things show certain life activities.

How can you tell the difference? You can do the following simple experiments to make out.

1. Take two wide-mouthed bottles with lids. Make holes in one of the lids. Place some food such as bread crumbs or cooked rice in both the





*Watch the flies in both the bottles*

bottles. Keep the bottles open till a few flies are attracted by the food in them. Then quickly replace the lids. Watch the flies in both the bottles.

You can see the flies sitting on the food and eating it. On the other hand, the bottles do not seem to be eating any food. *Living things need food. Non-living things do not need food.*

2. Flies are living things and bottles are non-living things. Non-living things do not show any life activities. The smell of food attracts the flies. *Living things feel. Non-living things like bottles cannot feel.*

3. Keep the flies within the bottles for a few days. Watch them carefully and try to learn more about them. The flies try to escape from the bottles. So they may fly about within the bottle, trying to escape. But the bottles stay in the same place. *Living things move from place to place. Non-living things cannot move on their own.*

4. After a few days, you can see dead flies in one of the bottles. There are no holes in the lid of this bottle. The other bottle has the flies moving actively within it. The small ones have grown a little bigger. This bottle has holes in the lid through which air can go in. *Living things breathe. They need air to breathe. They die if there is no air. Living things grow.*

5. Suddenly you see some eggs on the sides of the bottle and some tiny worms wriggling on the food material. Within a few days you can see worms forming a cocoon round themselves. Soon they hatch out



into tiny flies. These eggs must have been laid by the mother flies in the bottle. *Living things reproduce their own kind.*

6. The flies which actively move about, feed and grow, finally die when they grow old. *Living things die when they grow old.*

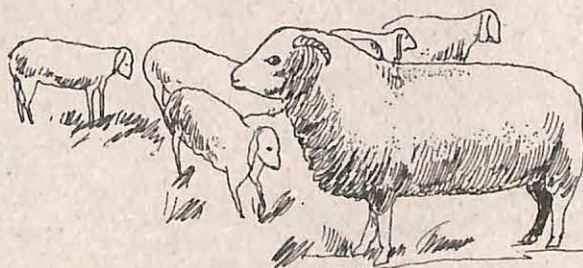
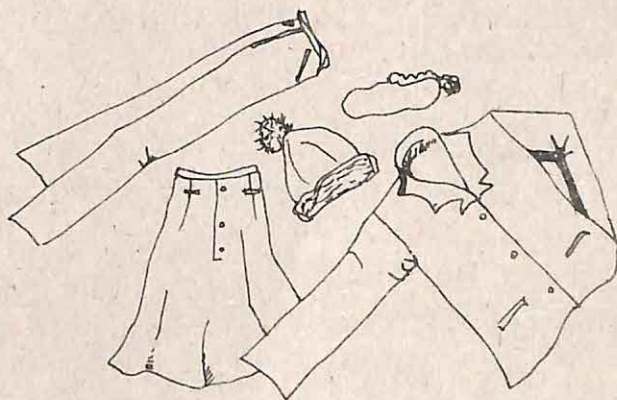
Now you know that living things show the following life-activities.

- a. Feeding
- b. Feeling
- c. Movement
- d. Breathing
- e. Growth
- f. Reproduction
- g. Death

### **Living things which are useful to man**

Some plants and animals are useful to man. We get food, clothes and shelter from both plants and animals.

We grow plants and keep animals which give us food or are useful to us in other ways.

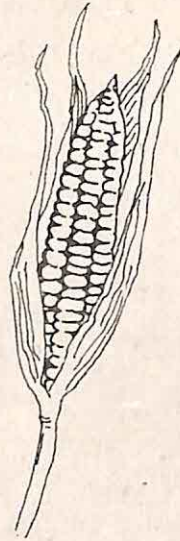


*Animals are useful*



## Food plants

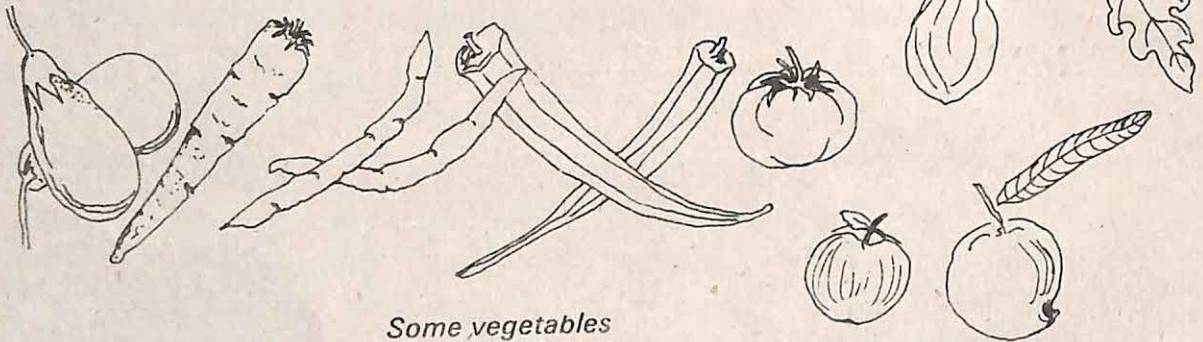
We get food grains from paddy, wheat, maize.



*Paddy, wheat and maize*

We get vegetables from brinjal, lady's fingers, beans.

We get fruits from mango trees, papaya trees.

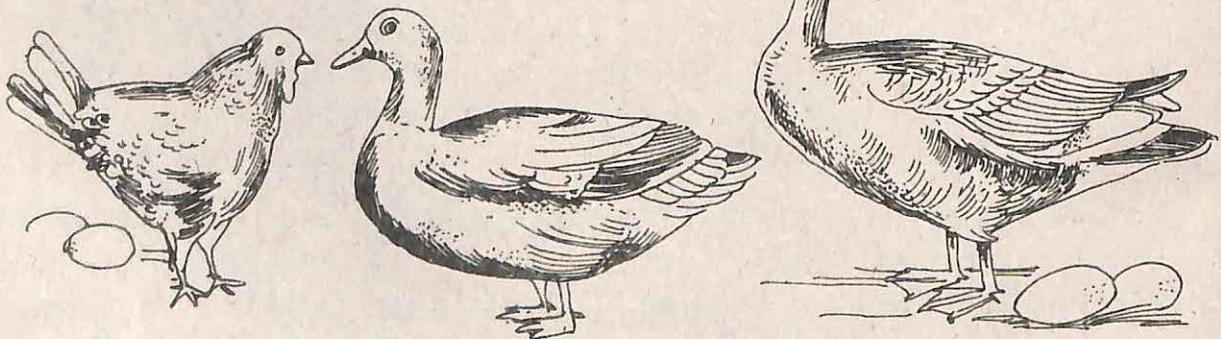


*Some vegetables*

## Food animals

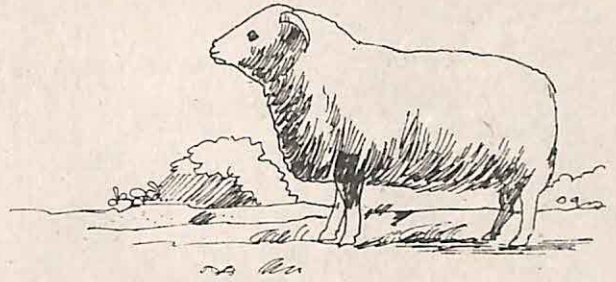
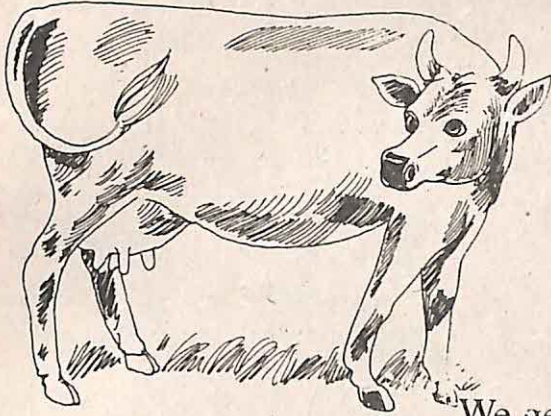
We eat the eggs of hens, ducks and geese

*Hens, ducks and geese*



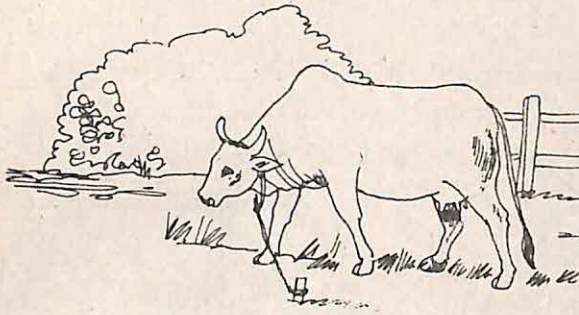


We eat the flesh of hens, sheep and cows.

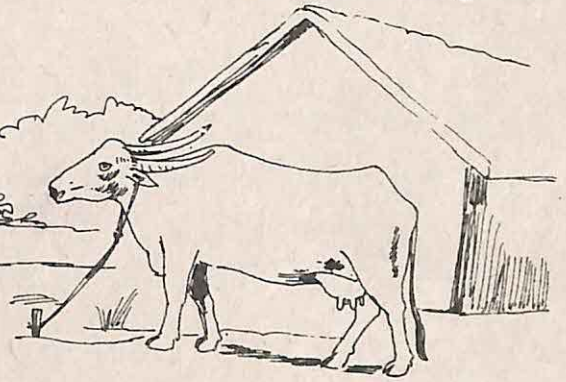


*Sheep and cows*

We get milk from cows, buffaloes and goats.

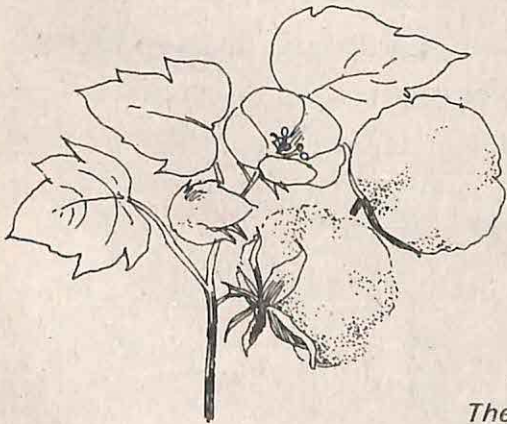


*Cows and buffaloes*

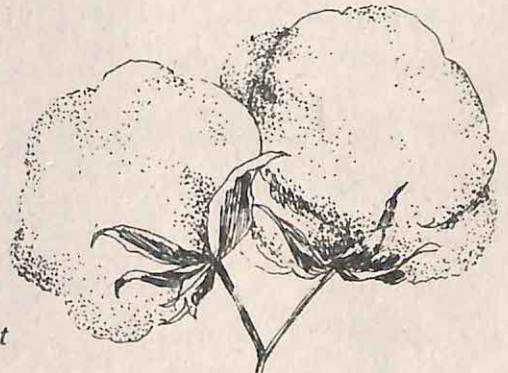


### **Clothes from plants and animals**

The cotton plant gives us fluffy cotton fibre. We make clothes out of cotton.



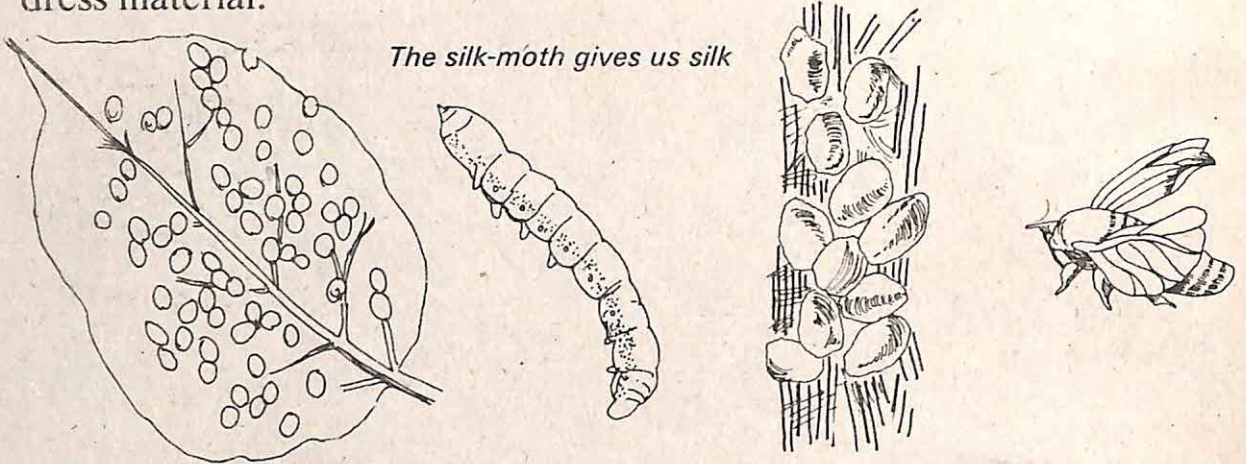
*The cotton plant*



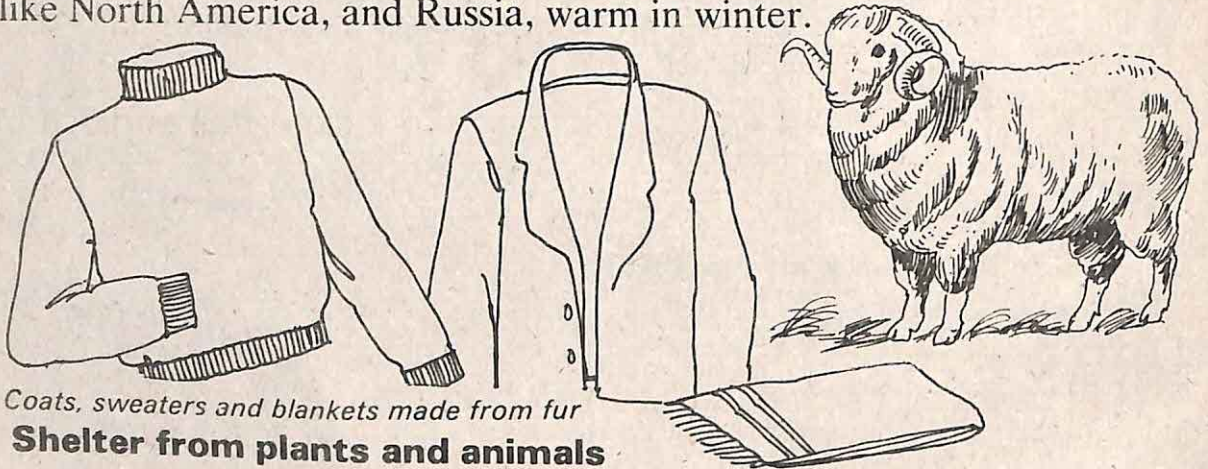


The worm of the silk-moth gives us fine silk. It spins a silken cocoon round itself. We use this silk for weaving silk sarees and other dress material.

*The silk-moth gives us silk*

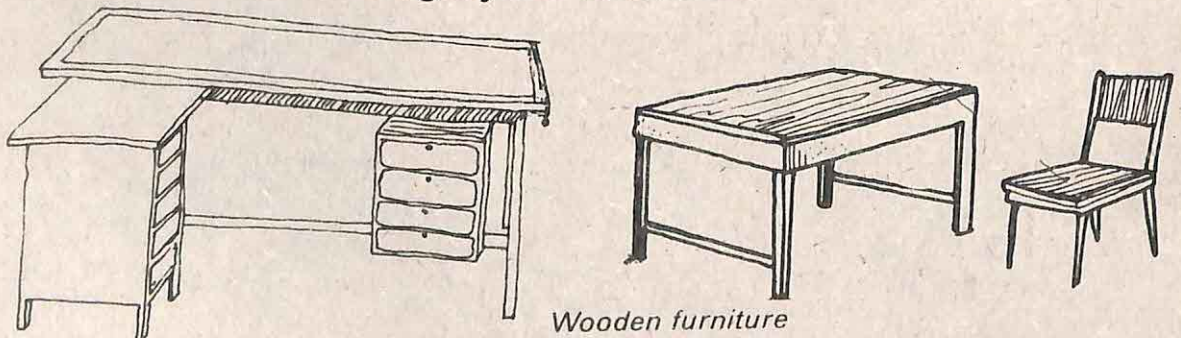


The fur of animals like sheep and silver fox, are useful for making coats, sweaters and blankets. They keep people in very cold countries like North America, and Russia, warm in winter.



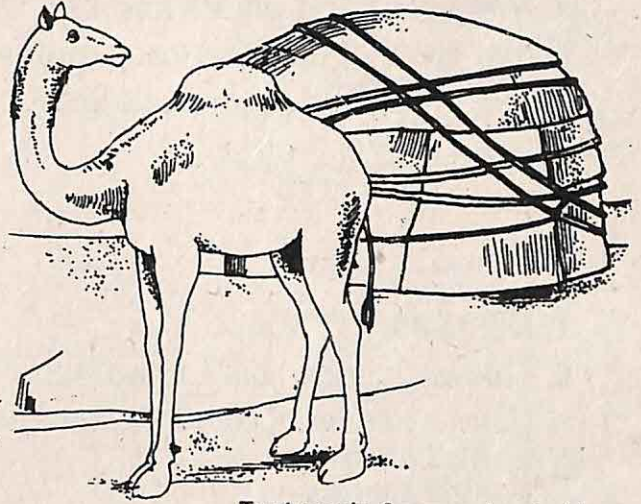
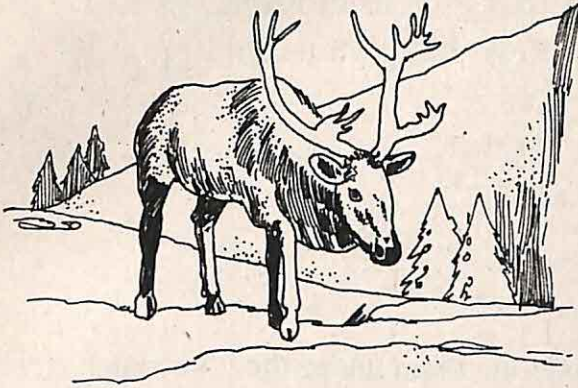
*Coats, sweaters and blankets made from fur*  
**Shelter from plants and animals**

We make building materials and furniture from the trunks of timber trees such as teak, mahogany and rosewood.



*Wooden furniture*





*Tent made from animal skin*

The skins of reindeer and camels are also used for making tents in very cold and very hot places.

We are human beings. We are living things. We make use of other things such as plants and animals.

### **Things to remember**

1. Plants, animals and human beings are living things.
2. We make use of living and non-living things.
3. Living things show certain life-activities. They are:
  - a. feeding
  - b. feeling
  - c. movement
  - d. breathing
  - e. growth
  - f. reproduction
  - g. death



4. Plants and animals are useful to us.
5. They give us food, clothing and shelter.
6. We grow food plants and keep animals which give us food.
7. We grow plants and keep animals that give us clothing.
8. We also grow plants and keep animals that give us shelter.

### Things to do

#### 1. FOR YOUR CLASS DISPLAY BOARD

Collect pictures of plants and animals. Group them under the following heads:

- a. food plants
- b. food animals
- c. plants which give us clothes
- d. animals that give us wool, fur and skin for clothes
- e. plants which give us furniture and building materials and
- f. animals whose skins are useful for making tents.

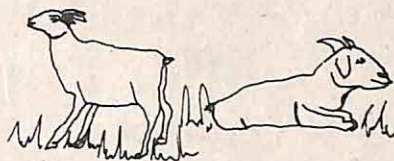
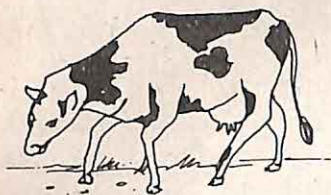
### Exercises

1. Describe the life-activities of a living thing you know.
2. How are plants and animals useful to us?
3. Find the odd one out in each group:
  - a. stone, grass, pin
  - b. rice, wheat, tomato
  - c. egg, mutton, carrot
  - d. skin, teak, rosewood
  - e. cotton, wool, fur
4. Write the names of five food plants against the type of food they give:
 

Food plants	Type of food they give
a. ....	vegetable
b. ....	fruit
c. ....	oil
d. ....	sugar
e. ....	food grain



5. Write the names of the food the following animals give you. Use the following words:



eggs, meat, milk, liver-oil

Food animals

Type of food

a. cow

.....

b. hen

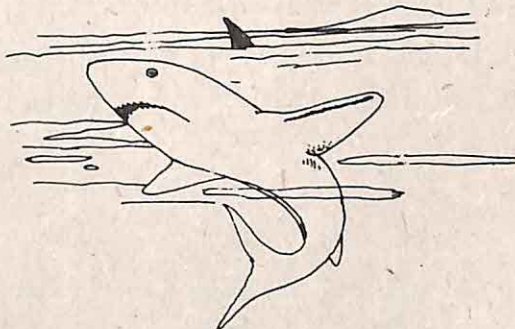
.....

c. goat

.....

d. shark

.....



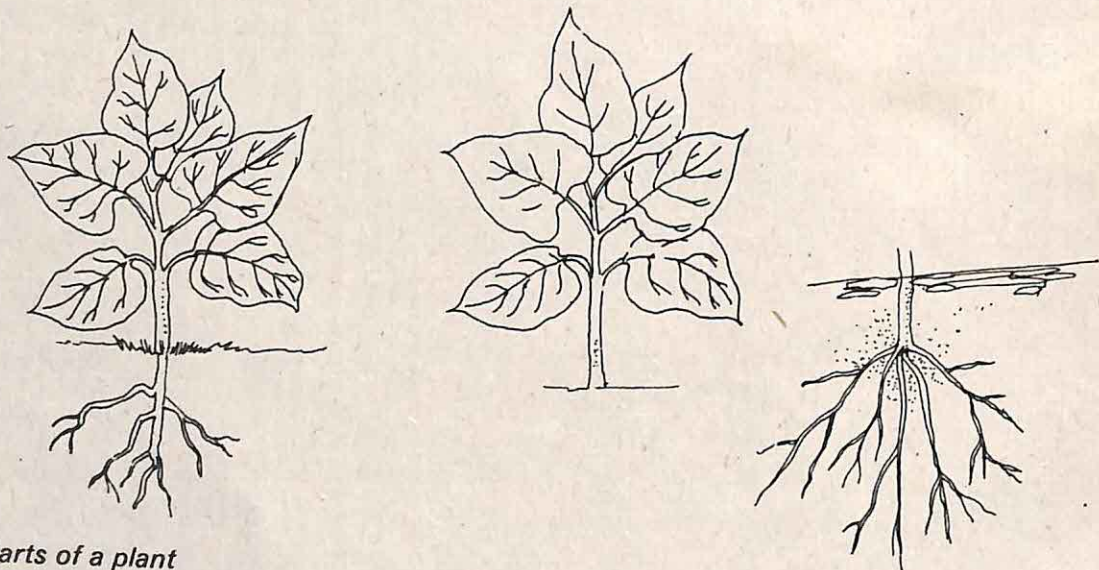


## 2. Parts of plants and how plants differ from animals

### Parts of a plant

Carefully pull out a small plant from the soil. Remove the soil sticking to the root by washing it in water. Keep the plant on a table and examine its various parts.

Does the plant have the same colour in the parts that were above the soil and those that were below the soil?



*Parts of a plant*

The part of the plant that grows above the soil is green. The part that grows below the soil is pale brown or white.

The green part is called the shoot. The shoot has a stem and leaves. When the plant grows bigger, it produces flowers and fruit.

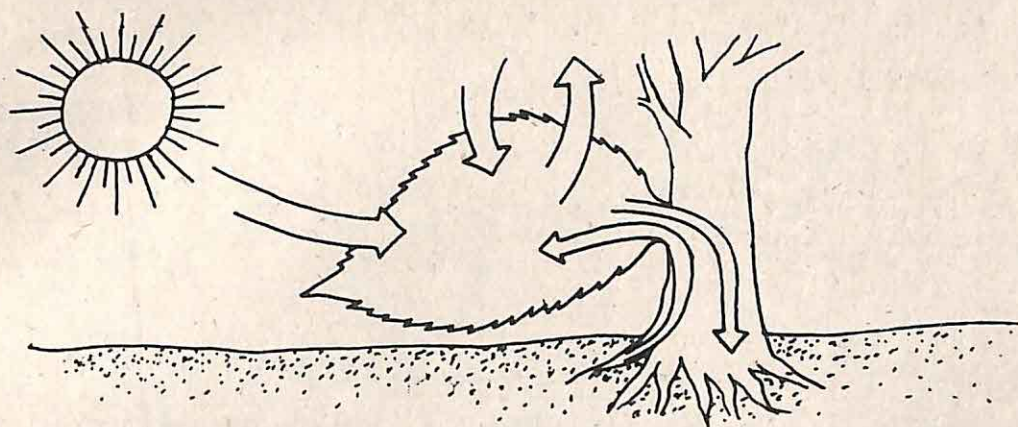
The pale brown or white part is the root. This root has branch-roots and rootlets.

### Why is the shoot green?

The shoot grows towards sunlight and it turns green. The leaves have a green coloured pigment. This pigment is called chlorophyll.



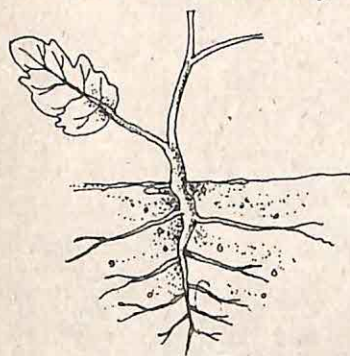
This pigment traps sunlight and helps the leaves to make their food. This food is supplied to all the other parts of the plant.



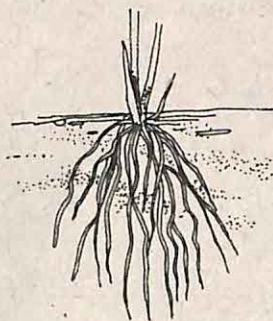
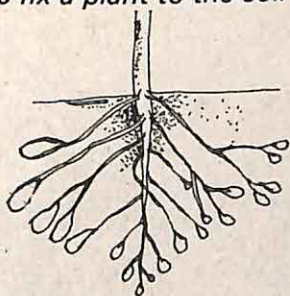
*Plants make food*

### **What do the roots do?**

The roots fix the plant firmly to the soil. Water dissolves minerals present in the soil. Plants need these minerals in order to make their food. So the roots suck them up and send them to the leaves where the food is actually made.



*Roots fix a plant to the soil*



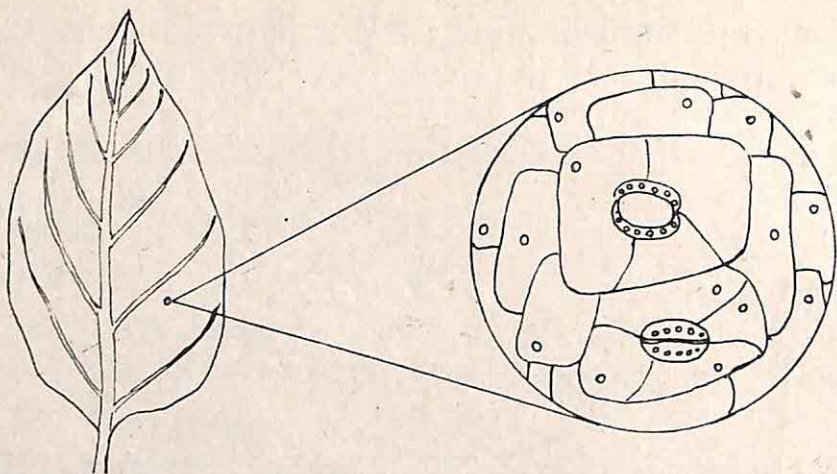
The roots of some plants like beet, carrot, turnip, radish, sweet-potato, etc. store extra food in their roots. This is why they are swollen. It is this swollen root we eat as vegetables.

The stem, fruit, and sometimes even the leaves and flowers, store food.

### **Plants as living things**

Plants feed and grow. Green plants prepare their own food with the

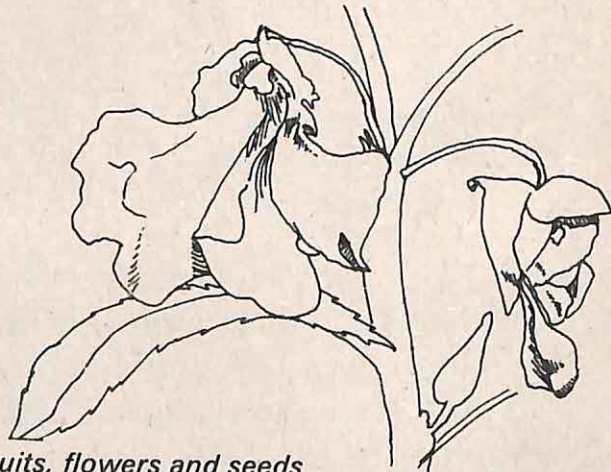
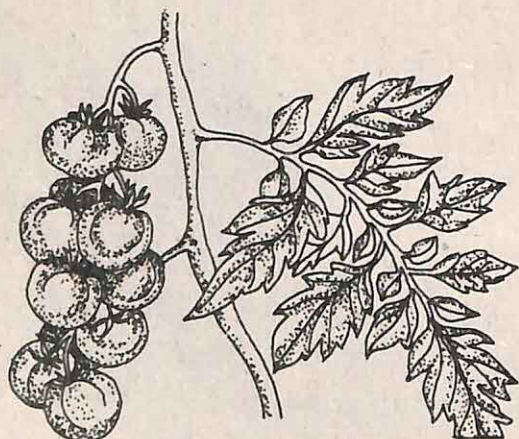




*Leaves have tiny pores*

*stomata*

help of sunlight. They have tiny pores, called *stomata*, in their body parts, mainly in their leaves, for breathing. Air goes in and out through these tiny pores. The plant does not go in search of its food. It gets it from the soil to which it is fixed by its roots. However, the roots spread out well and suck the water that is made nutritious by the minerals dissolved in it. A plant produces flowers, fruits and seeds. It grows out of a seed. The seed of a plant grows from which it came into the same kind of plant. This is how plants reproduce their own kind through seeds. Plants die when they become old.



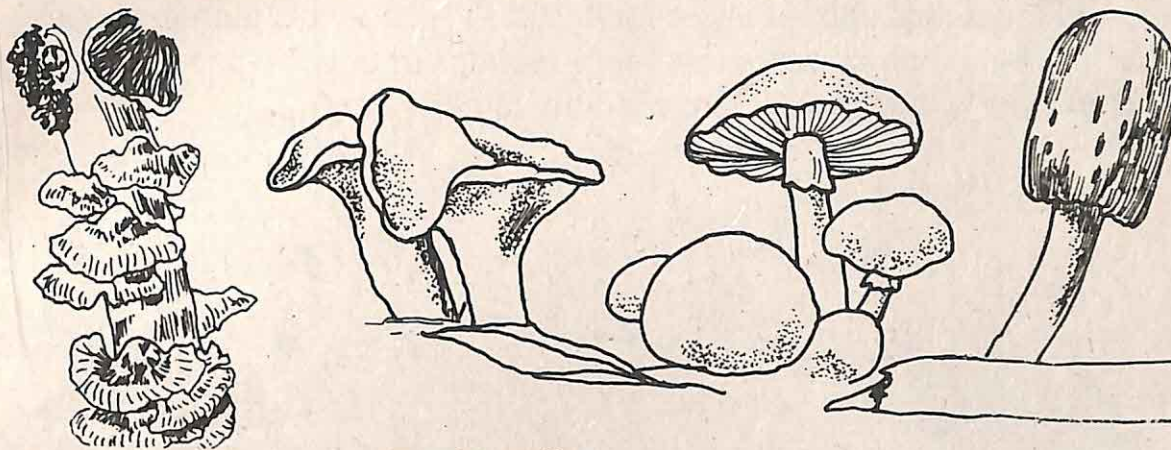
*A plant produces fruits, flowers and seeds*

### **Non-green plants**

All plants are not green. Some plants, like moulds and mushrooms, have no green pigments. So they cannot make their own food as green plants do.



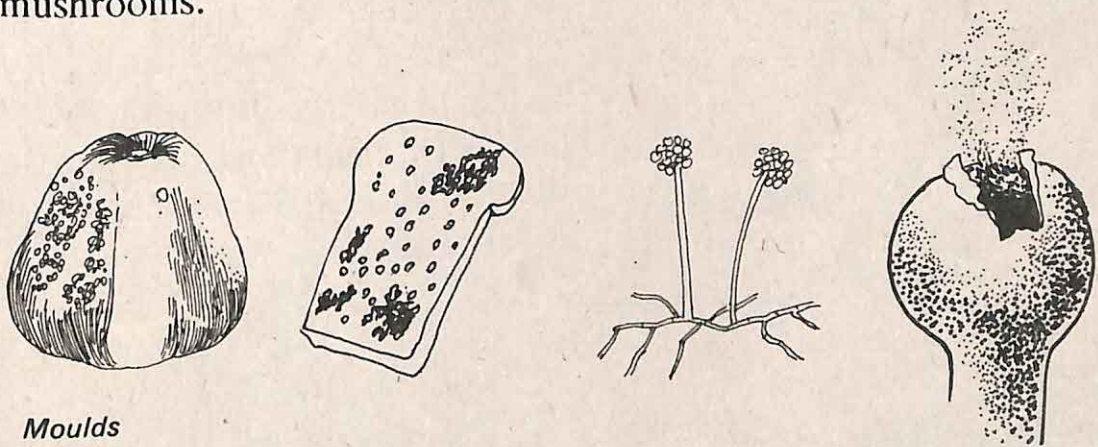
Non-green plants grow on decaying and dead matter. Moulds grow on old and stale food material. Mushrooms grow on rubbish heaps and on dead logs of wood. They take nourishment from these dead and decaying material.



*Non-green plants grow on decaying matter*

### **How do non-green plants reproduce?**

Moulds and mushrooms do not produce seeds. They produce *spores*. These spores are so light that they are carried by the wind. They fall on different places where they grow again into moulds and mushrooms.



*Moulds*

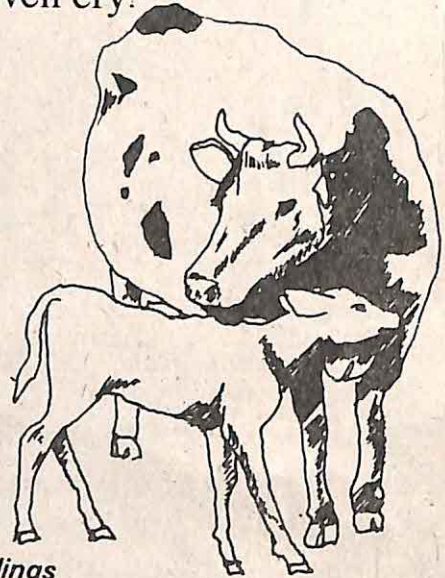
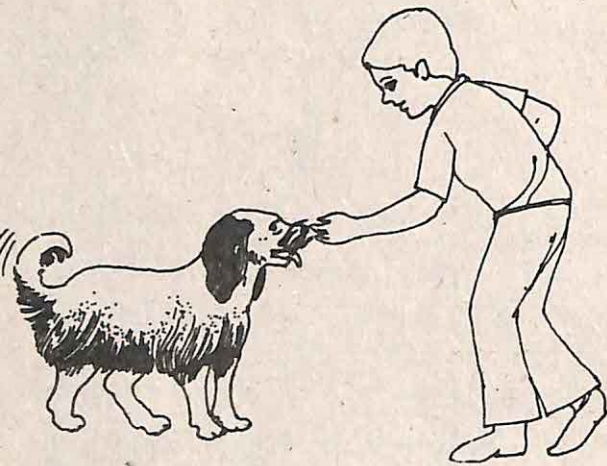
### **How to grow moulds**

If you keep a piece of stale bread exposed to air, you can see fluffy, hair-like growths on it in a few days. This is mould. The spores would have been blown by the air. The spores would have fallen on the piece of bread and have grown into moulds.

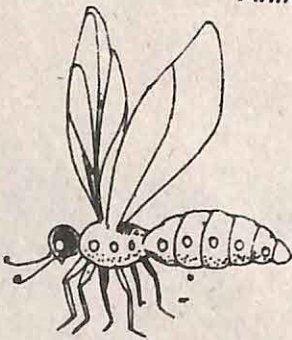


## Animals are different from plants

Plants show various life-activities such as feeding, growth, breathing, reproduction and death. But they cannot move from place to place as animals do. Plants are firmly fixed to the soil by their roots. Plants also cannot show feelings of joy, hunger, pain in the way animals do. Animals can show these feelings openly by producing various kinds of noises. Some of them can even cry.

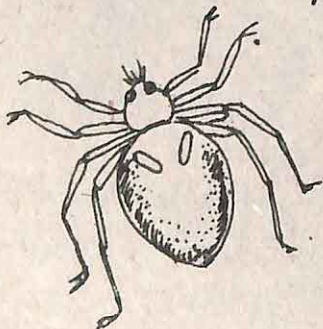


*Animals can show their feelings*

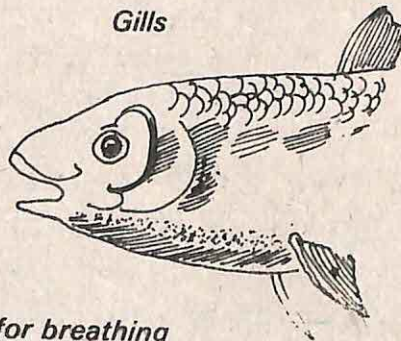


*Pores of air tubes*

Plants breathe through pores in their leaves and other body parts. Animals have different kinds of organs for breathing. Insects have



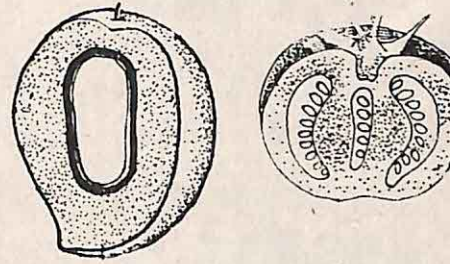
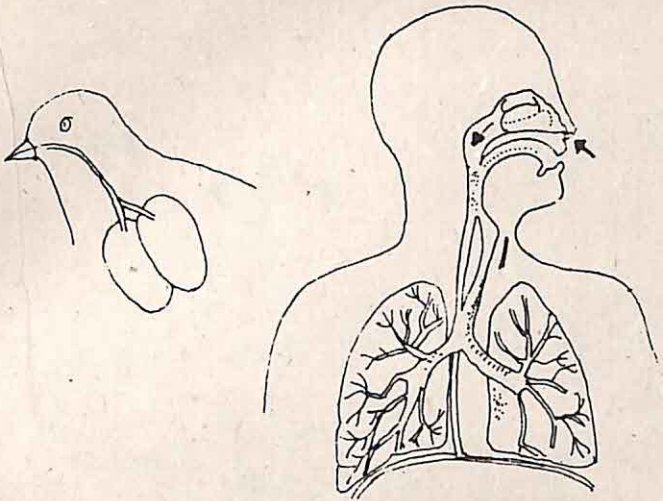
*Gills*



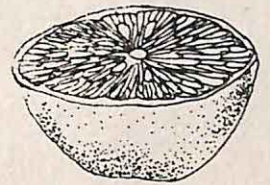
*Different organs for breathing*



air tubes, fishes have gills. Other animals such as squirrels, snakes, elephants and human beings have lungs.

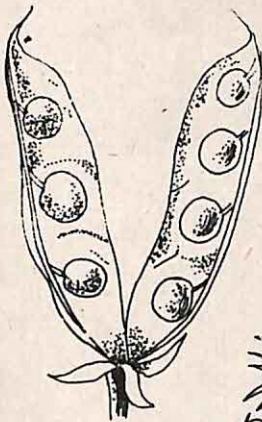


seeds

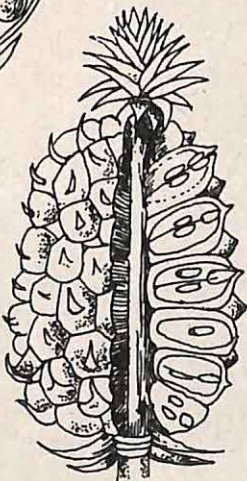
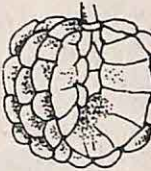


*Some animals have lungs*

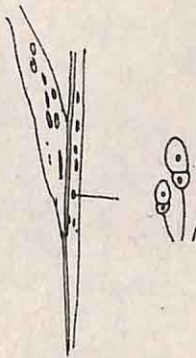
Plants reproduce through seeds and spores.



seeds

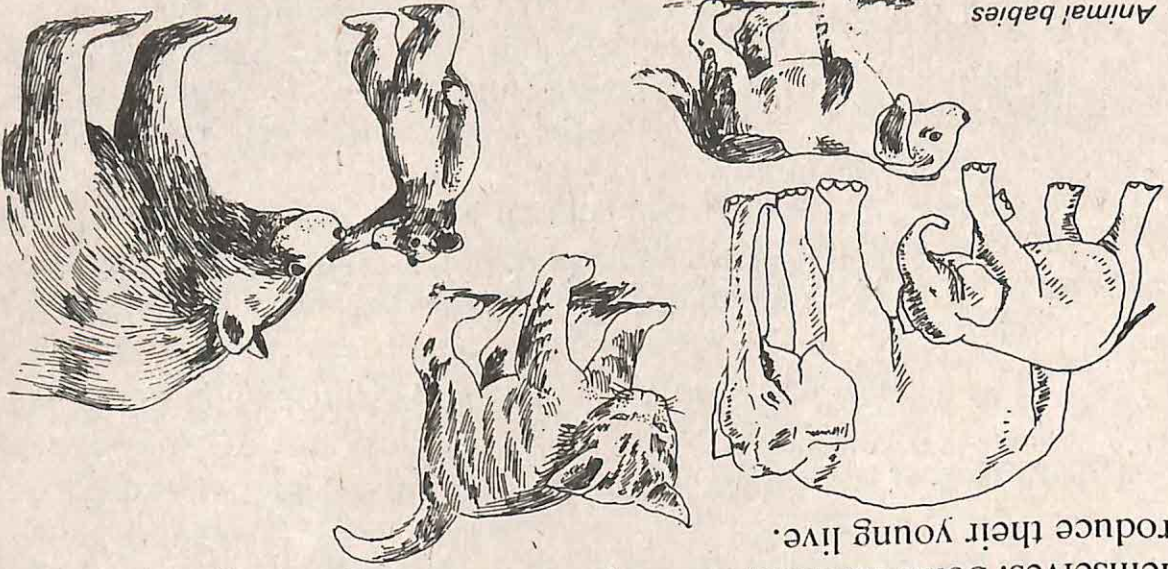


spores



*Plants have seeds and spores*





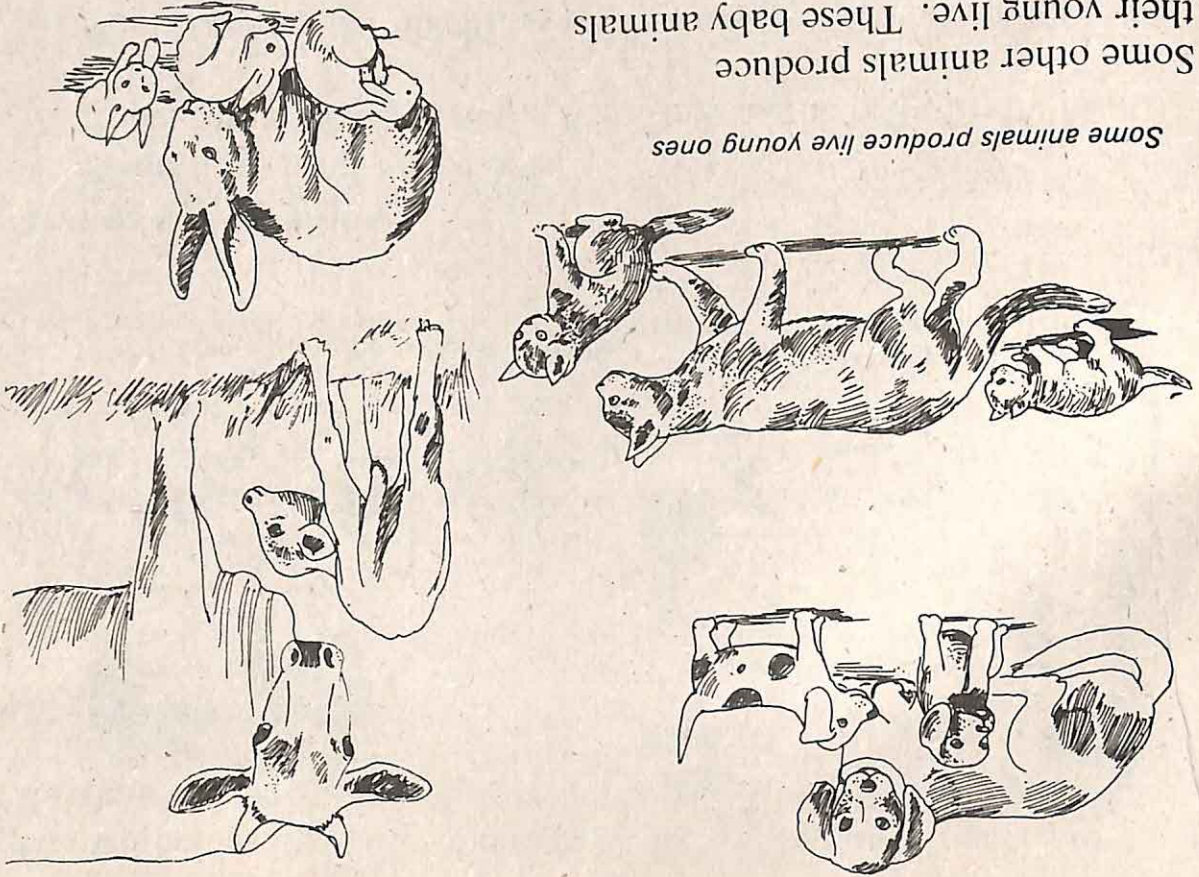
produce their young live.

themselves. Some animals, like elephants, lions, tigers, dogs and cats until they grow old enough to be independent and able to look after

are looked after by their parents their young live. These baby animals

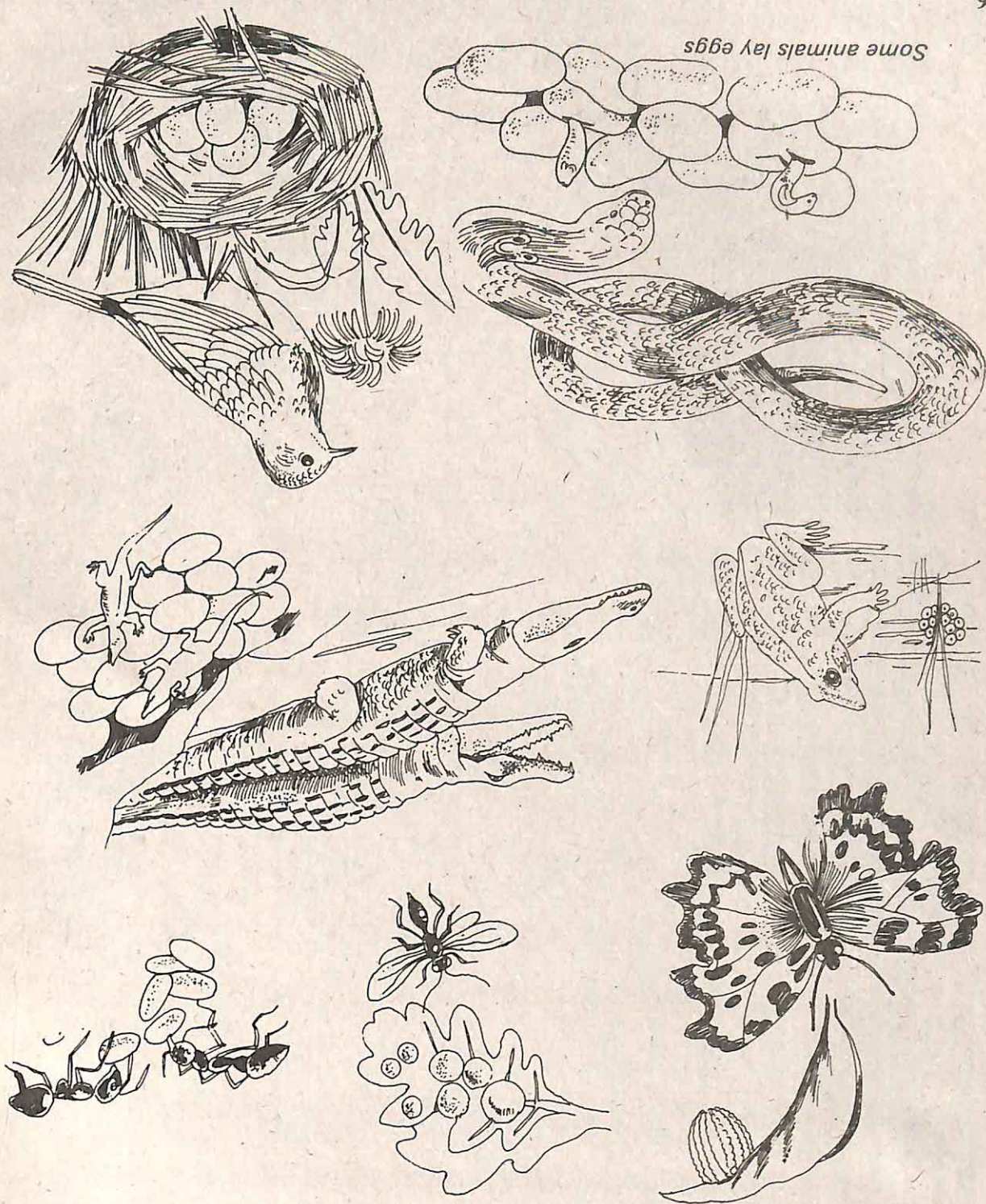
Some other animals produce

Some animals produce live young ones





Some animals lay eggs



Some animals lay eggs and their young ones are hatched from these. Insects, birds, lizards, snakes and frogs are egg-laying animals.



Human beings look after their babies for a long time, right upto the time they are adults.



*Human beings look after their babies*

### **Things to remember**

1. Plants have roots and shoots.
2. Roots spread out well in the soil. They fix the plant firmly to the soil.
3. Roots suck up the nutritious water from the soil and send it to the shoots.
4. The shoots grow towards sunlight.
5. Leaves have green pigments. They prepare food in the presence of sunlight.
6. Water, with all its mineral nutrients, reaches the leaves through the shoots.
7. Roots and various parts of shoots store extra food.
8. Green plants reproduce through seeds.
9. Moulds and mushrooms are non-green plants. They have no green pigments. So they cannot make any food on their own.
10. Non-green plants reproduce through spores.



11. Plants differ from animals in many ways.

- a. Plants are fixed to the soil by their roots. They get their nutrients from the soil. Animals move from place to place in search of food.
- b. Green plants prepare their own food in their leaves. Animals cannot prepare their own food. They eat plants or other animals.
- c. Plants breathe through pores in their leaves and other body parts. Different animals have different kinds of organs for breathing. Insects have air tubes, fishes have gills, elephants, snakes and birds have lungs.
- d. Plants reproduce through seeds and spores. Animals reproduce by laying eggs or producing live young ones.
- e. Plants cannot show their feelings openly. Animals can show their feelings of joy, anger and pain openly.

### **Things to do**

1. FOR YOUR CLASSROOM DISPLAY BOARD

- a. Grow plants from seeds. You can use small dishes spread with cotton wool for sowing the seed. The cotton wool must be always kept moist so that the plants do not dry up. Mustard seeds grow quickly. Bean seeds take a long time to grow. Label the plants and display them.
- b. Keep stale bread or cooked rice in a dish. Keep the food a little moist. You can see mould growing on it within a few days. Display this in your classroom too.

2. Note the cries of animals and the calls of various birds. Note how the call of a bird differs at different times of the day or when it is in pain or in danger. This is true of animals as well.

IN YOUR SCIENCE NOTEBOOK

1. Draw the parts of a plant. Colour them, label the parts suitably.
2. Paste pictures of animals and birds and write the names of their cries or calls against each of them. (For example, a cow 'moos', a crow 'caws', and so on.)
3. Cut the umbrella part of the head of a mushroom. Place it on a white sheet of



paper. Cover it with a glass tumbler. Leave it undisturbed. Remove the tumbler, and the 'umbrella' part of the mushroom carefully. You might see spores on the paper, forming a wheel-like pattern.

### Exercises

1. Which part of the plant is called the shoot?
2. What other parts does the shoot have?
3. What pigments do leaves have? How are they useful?
4. Where do roots grow?
5. What work do roots do?
6. Can non-green plants prepare their own food? Why?
7. How do green plants reproduce?
8. How do non-green plants reproduce?
9. Give five points of difference between plants and animals.
10. Write the names of the cries or calls of the following against their pictures.  
Choose the correct words from this box:

chirps, roars, chatters, trumpets, grunts, neighs, brays, caws.



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### 3. Plants grow from seeds

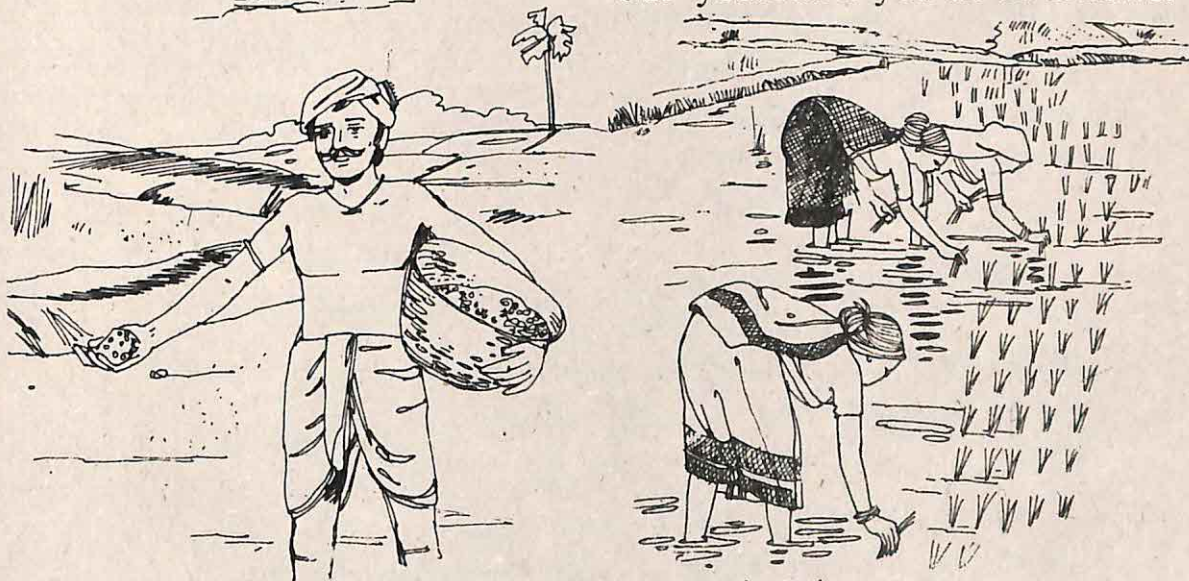
Plants are living things. They reproduce through seeds. It is easy to grow plants from seeds. Some seeds, like mustard and spinach, grow into plants very quickly. Some other seeds, like beans and peas, take a long time to grow into plants.

The growth of a plant from its seed is called germination.



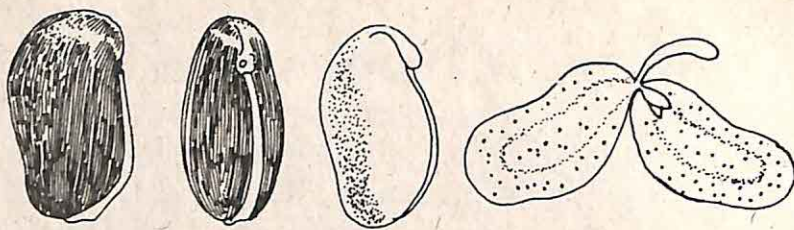
Seeds are sown in the soil to produce new plants. To grow paddy, seeds are sown in nurseries. When they grow to a certain size, they are uprooted and planted in fields. Growing seeds in the nurseries and transferring the young plants into fields and gardens is called transplantation. Vegetables like tomatoes and chillies are also grown in this way.

What does a seed have that grows into a plant? You can find out yourself if you do as follows.



*Transferring young plants is called transplantation*





*Parts of a bean seed*

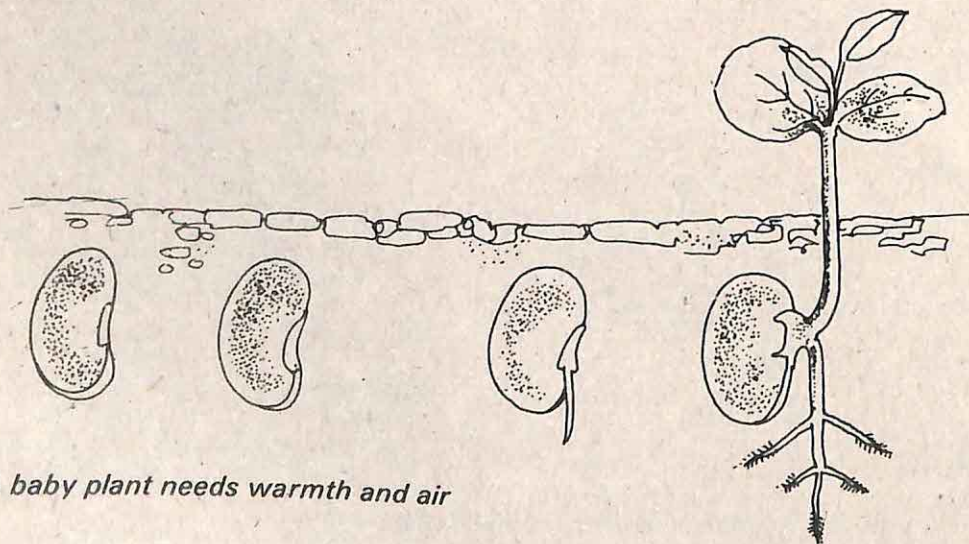
### **Parts of a bean seed**

Soak some bean seeds in water for a few hours until they swell. Take a seed and press it well with your fingers. A tiny drop of water comes out of a small hole or pore in the seed. This hole is the seed pore. The outer skin of the seed protects the inner parts. This skin is the seed coat. Peel off the seed coat. Now you can see two fleshy parts filled with food. These are the seed leaves. Carefully open out the seed leaves. You will now see a tiny leaf-like part and a tiny root-like part. This is the baby shoot and the baby root. During germination, this baby plant becomes active as it sucks in water and begins to grow into a new plant. The baby plant makes use of the food stored in the seed leaves when it grows.

### **Germination of a bean seed**

Seeds need water, air and warmth for germination

Can dry seeds germinate? Seeds need water to make the baby plant active. The baby plant needs air and warmth for its living.



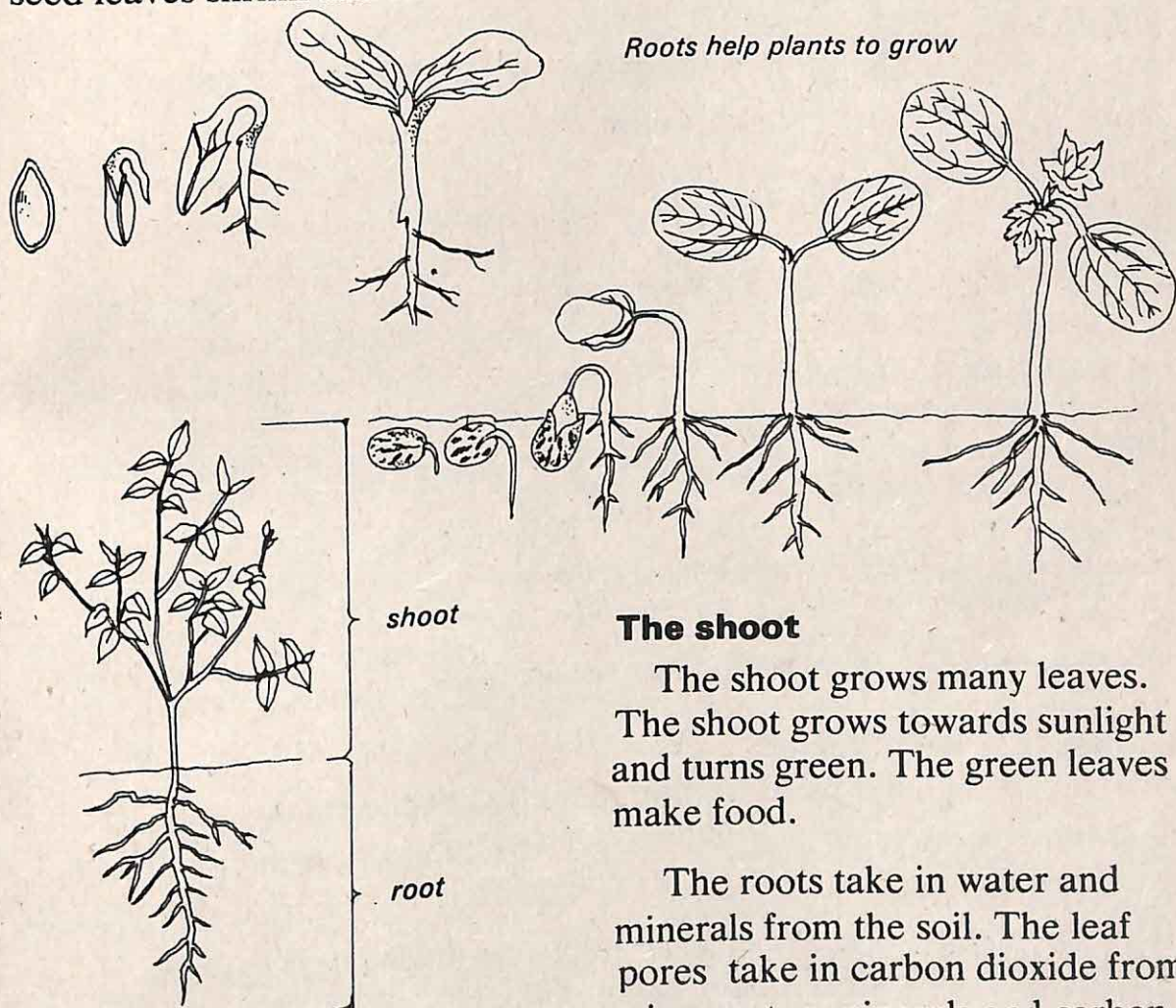
*A baby plant needs warmth and air*



The young plant with its seed leaves is called a seedling.

The roots grow in the soil. They grow bigger and stronger. They get side-roots and rootlets. They absorb water and minerals from the soil and supply them to the leaves.

The baby plant is so young that it cannot take food from the soil. So it has plenty of food stored in the seed leaves. The baby plant makes use of this food for its growth. As the amount of food finishes, the seed leaves shrink and fall.



*Roots help plants to grow*

### **The shoot**

The shoot grows many leaves. The shoot grows towards sunlight and turns green. The green leaves make food.

The roots take in water and minerals from the soil. The leaf pores take in carbon dioxide from

the air. Green leaves make food by using water, minerals and carbon dioxide. They need sunlight to do this.

All green plants make their own food in their leaves using sunlight, water, minerals and carbon dioxide.

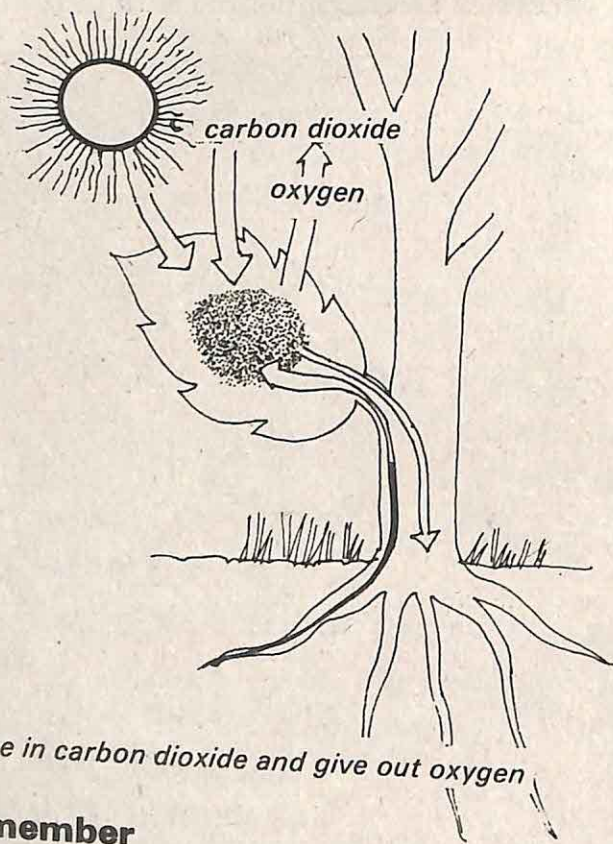


## Green plants purify air

All living things breathe in oxygen and breathe out carbon dioxide.

Green plants clean the air by taking in carbon dioxide and giving out oxygen. This they do when they prepare food during the day when the sun is shining. This takes place through the leaf pores.

The oxygen given out by plants while making their food is useful to animals.



### Things to remember

1. The growth of a plant from its seed is called germination.
2. Many plants grow from their seeds. Seedlings of some plants are transplanted.
3. The baby plant found in the seed grows during germination.
4. The baby plant has a baby shoot and a baby root.
5. Seeds need water, air and warmth for germination.
6. The young plant with seed leaves is called a seedling.
7. It is the green leaves in a plant which make the food. They do this only when they get sunlight during the day.



8. Green leaves use **water, minerals and carbon dioxide** for making food.
9. Green plants make their own food. Non-green plants get their food from dead and decaying plants and animals.
10. All living things breathe in oxygen and breathe out carbon dioxide.
11. Green plants use the carbon dioxide in the air and give out oxygen to it when they make food.
12. Green plants purify the air. All other living things use the oxygen given out by green plants when they make food.

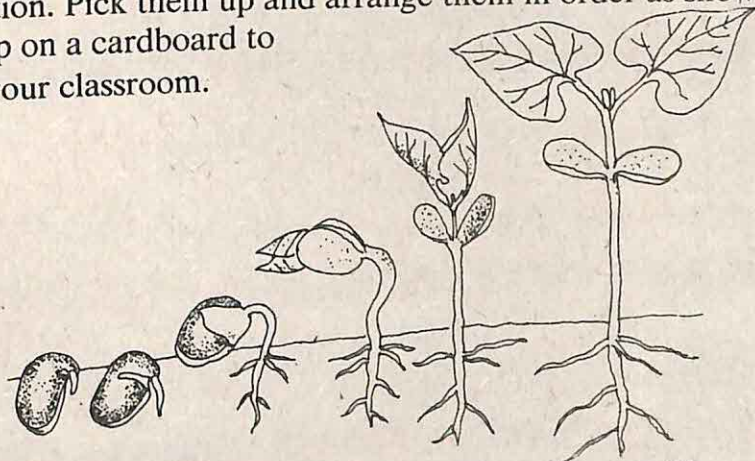
### Things to do

1. Here is a way to germinate bean seeds.

Take a wide-mouthed bottle. Roll a piece of blotting paper and put it in the bottle. Keep the soaked mustard seeds between the blotting paper and the bottle. The blotting paper should always be wet. So, pour water into the bottle at regular intervals. The seeds will begin to germinate within a few days.

2. For classroom display

Germinate bean seeds at different times so that you can see the various stages of germination. Pick them up and arrange them in order as shown in the figure. Pin them up on a cardboard to display in your classroom.



3. Germinate other seeds such as **mustard** and **bengal gram**. You will notice that mustard germinates very fast whereas bengal gram takes a long time to germinate.



## Exercises

1. Answer the following questions briefly:
  - a. What is germination?
  - b. What is transplantation?
  - c. What is a seedling?
  - d. When do green leaves make their food?
  - e. When do green leaves give oxygen to the air?
  - f. How do we make use of this oxygen?
2. Write the use of or need for each of the following. The clues are given below.
  - a. air, water and warmth .....
  - b. sunlight, carbon dioxide and water .....
  - c. pure air with oxygen .....
  - d. seed leaves .....
    - for breathing
    - for green plants to make their food
    - food for the baby plant
    - for germination
3. Who am I?
  - a. I have a tiny pore and a coat. I have food stored for the baby plant. I am a .....
  - b. I have a tiny shoot and tiny root. I am found in a seed. I am carefully protected by the seed leaves. I am .....
  - c. I am a tiny plant. I have seed leaves. I make use of food stored in them. I am a .....
  - d. I have tiny seeds. I am grown through transplantation. I am .....

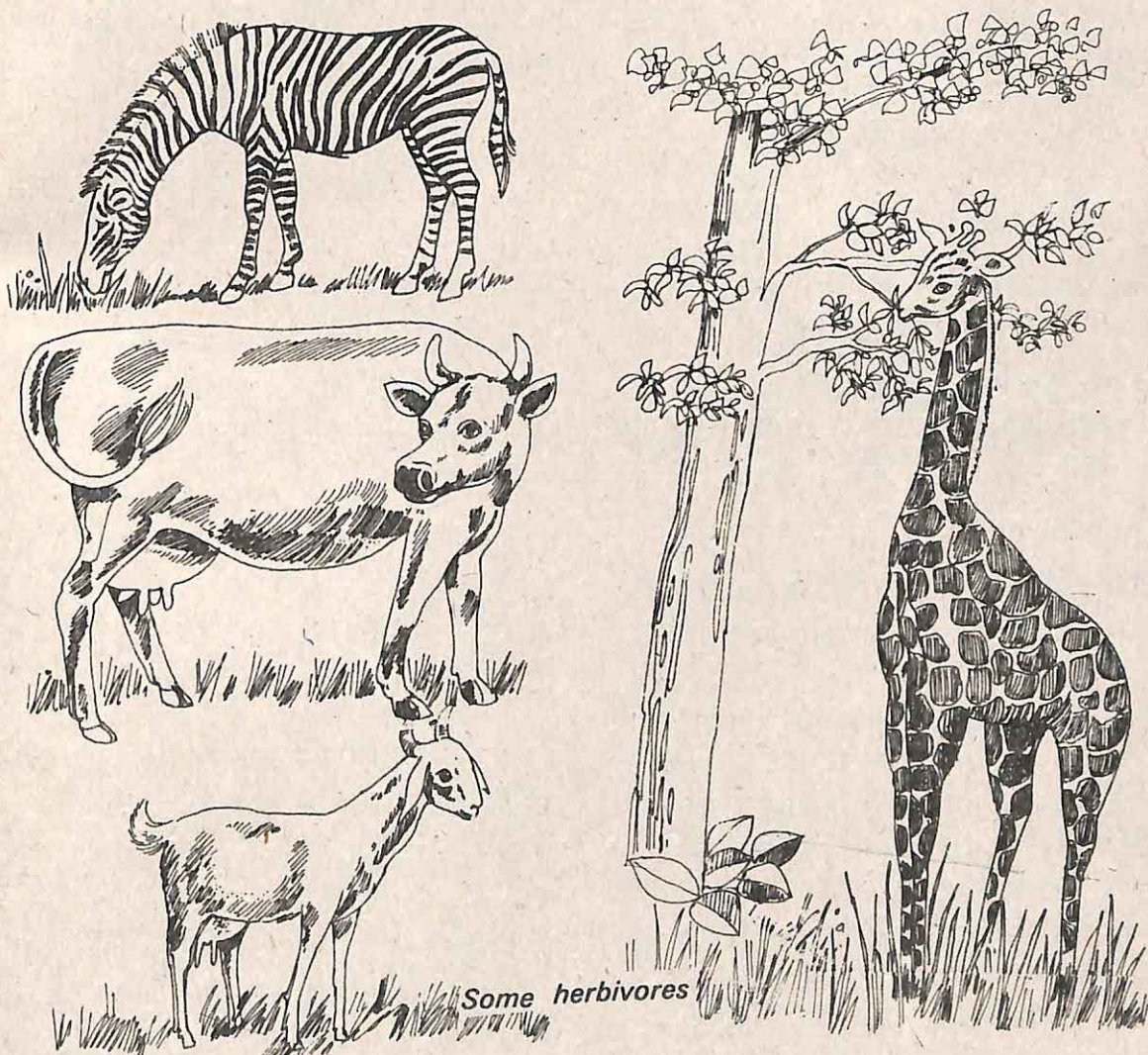


## 4. Feeding habits of animals

Animals are of different kinds. They live in different places. The parts of their bodies differ. So their feeding habits are also different.

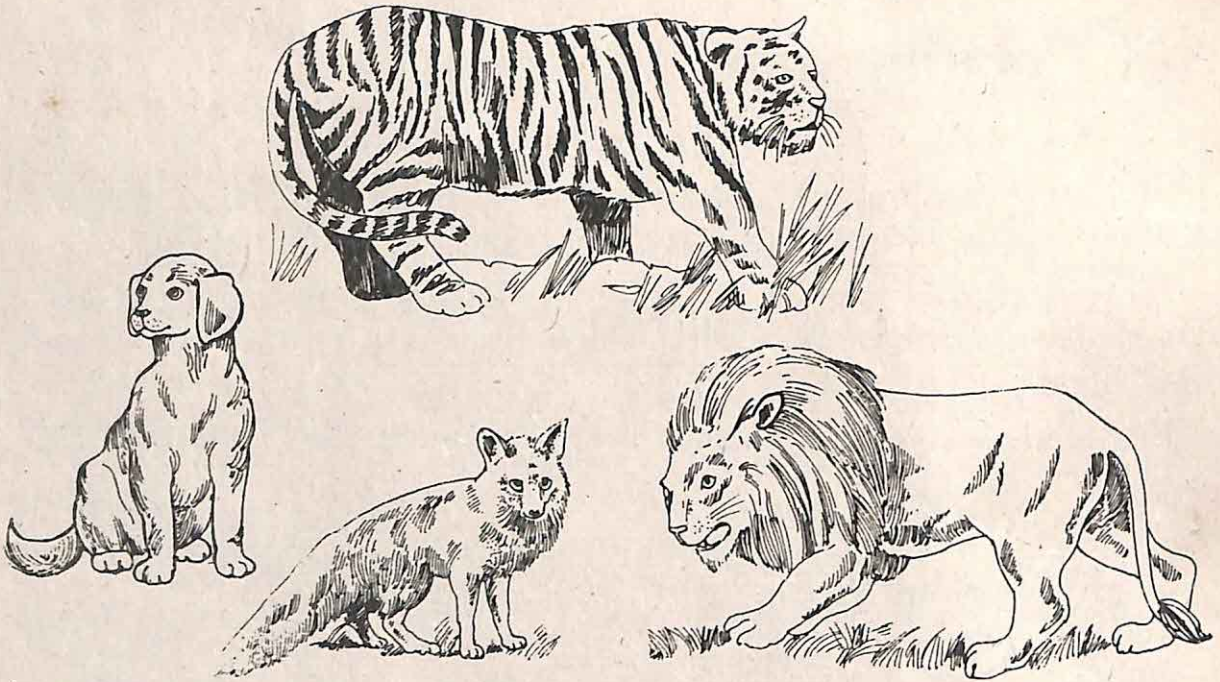
Because of this, animals eat different kinds of food. Some animals eat plants. Others eat the flesh of other animals. Yet other animals eat both plants and animals.

Plant-eating animals are called herbivorous animals, or herbivores.





Flesh-eating animals are called **carnivorous animals**, or **carnivores**.



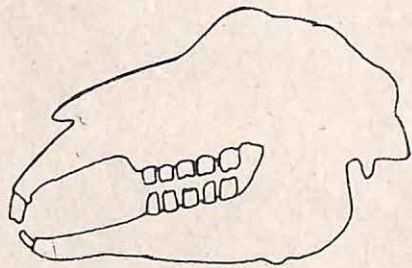
*Some carnivores*

Animals which eat both plants and animals are called **omnivorous**, or **omnivores**. Man is an omnivore.

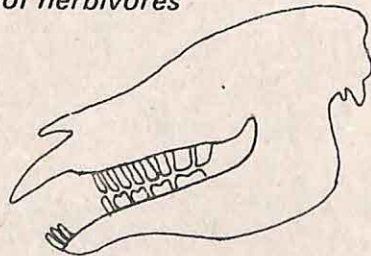
The feeding habit of animals depend upon their body parts. Animals have teeth or mouth parts, legs, claws suited to their food they eat.

### **Teeth of animals**

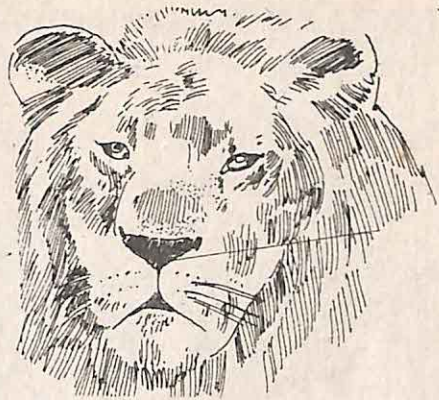
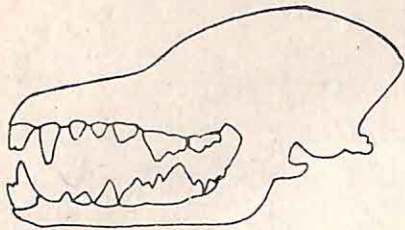
**Herbivores:** Herbivorous animals such as the cow and the buffalo have two sets of teeth. The front teeth are strong, flat and sharp for biting or cutting the plant parts. They have strong grinding teeth at the back for chewing the plant food. They do not need any teeth for tearing their food. So there is a gap between the front and the back teeth.



*Teeth of herbivores*

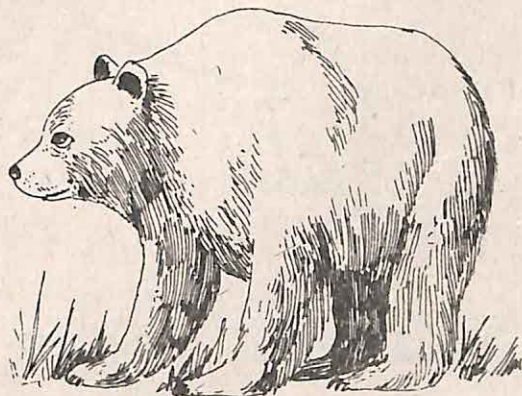






*Teeth of carnivores*

**Carnivores:** Carnivorous animals like the cat, the dog, the lion, the tiger have very sharp, curved teeth for tearing the flesh of their prey. Their grinding teeth are also very strong and sharp. Sometimes carnivorous animals break the bones of their prey with their grinding teeth. They do not have biting teeth.

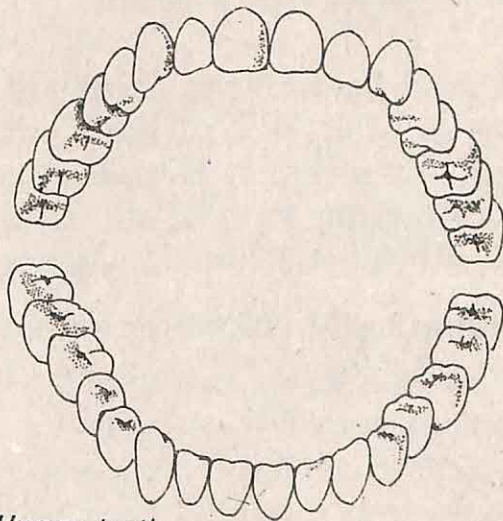


*Some omnivores*

**Omnivores:** Omnivorous animals like the bear, the monkey and man have all the three kinds of teeth for biting or cutting, for tearing the flesh and for chewing or grinding the food. Animals eat both solid and liquid food.

### **Mouth parts of animals that suck liquid food**

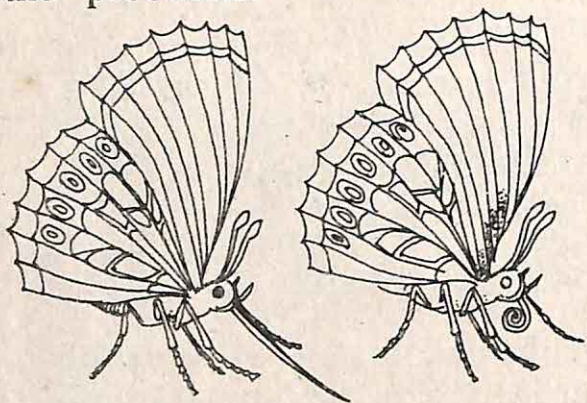
Butterflies and moths suck nectar from flowers. They have a



*Human teeth*



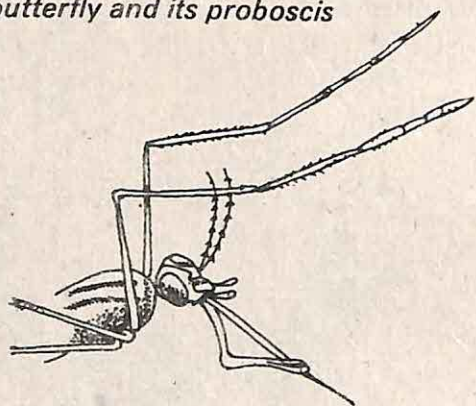
long tube-like tongue for sucking nectar from flowers. This is called the proboscis.



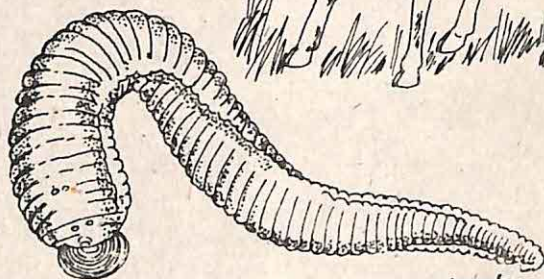
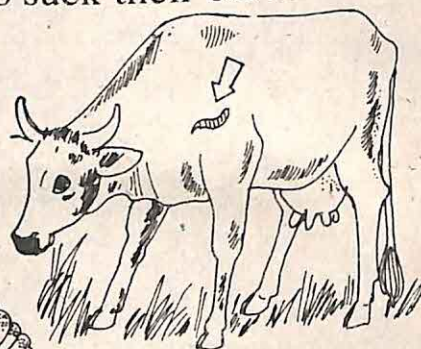
*A butterfly and its proboscis*

The proboscis is kept wound up like a watch-spring when it is not in use. It is stretched out only when the animal wants to suck nectar.

Mosquitoes and bugs have sharp, pointed mouth parts for piercing through the skin of animals to suck their blood.



*Sharp mouth parts of a mosquito*



*A leech sucks the blood of animals*

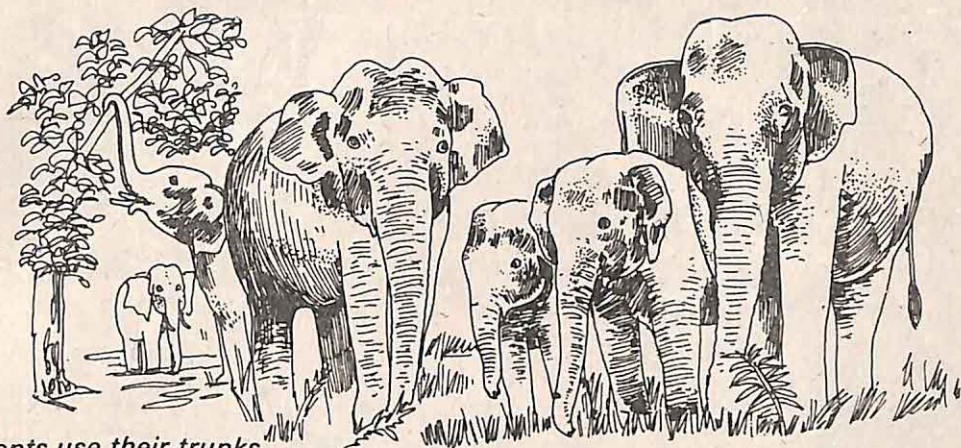
A leech sucks blood, mostly of herbivorous animals, when they graze in forest. A leech has a circular mouth with 'toothed' jaws. It clings to the victim and punctures its skin with these. Then it sucks blood from the body of the victim until its stomach is full. Then it leaves the animal and does not feed for many days.

### **Feeding habits of other animals**

Herbivorous animals like the zebra, the giraffe, and the deer bite or cut plants very fast and eat a lot of food in a short time. They have long legs to escape from carnivores when they are feeding. They always move in herds.

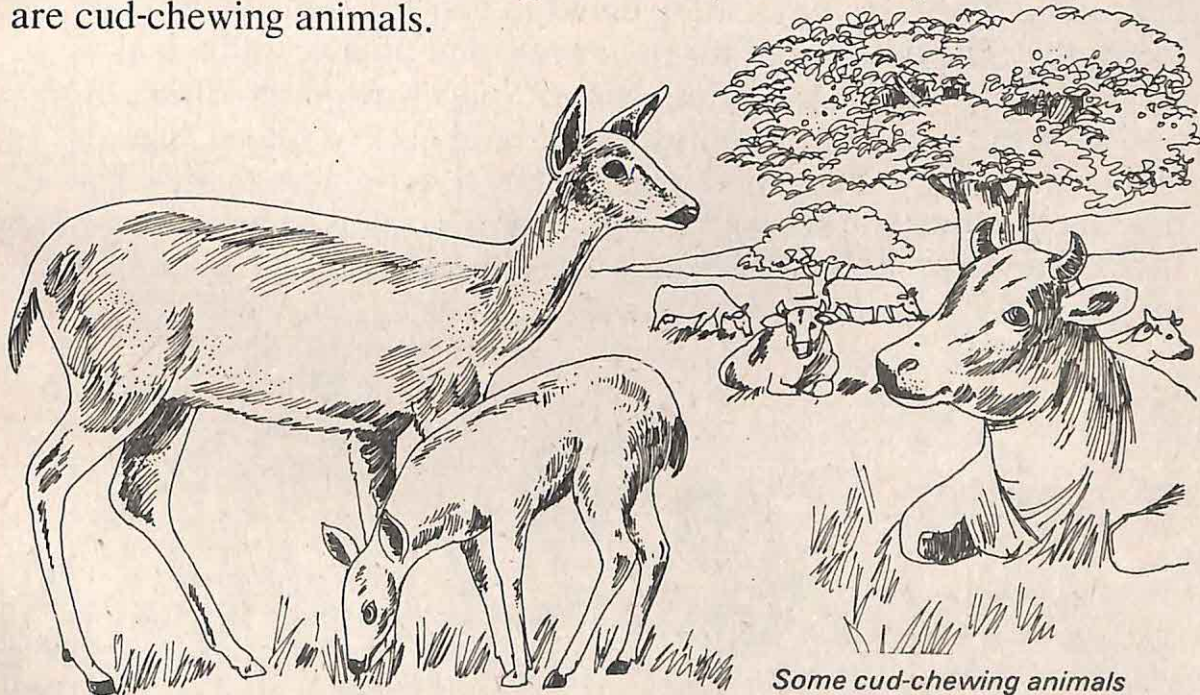


An elephant uses its trunk for pulling leaves and even to break branches of trees. Elephants also move only in herds. Herbivorous animals find safety in numbers.



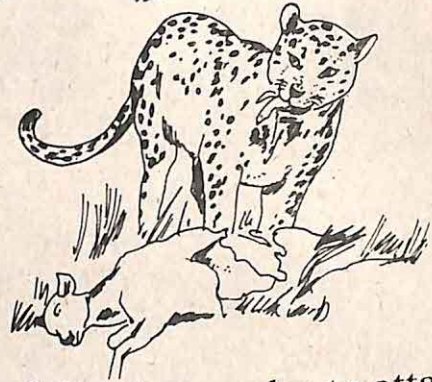
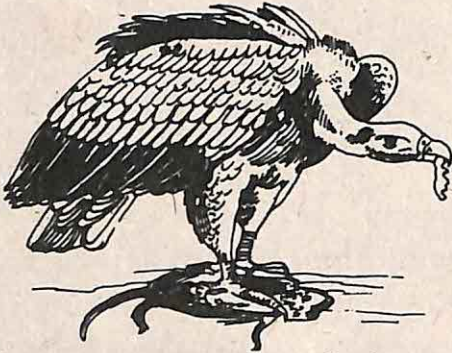
*Elephants use their trunks*

Some herbivorous animals chew the cud. Since these animals feed on plants hurriedly for fear of carnivorous animals, they have no time to chew their food properly. So they bring the swallowed food back into their mouth and chew it leisurely, sitting under the shade of a tree. This is called cud-chewing. The cow, the buffalo, the deer, etc are cud-chewing animals.



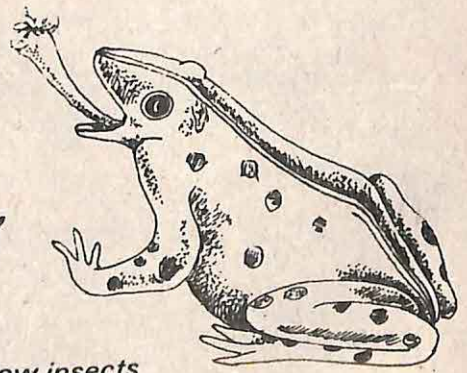
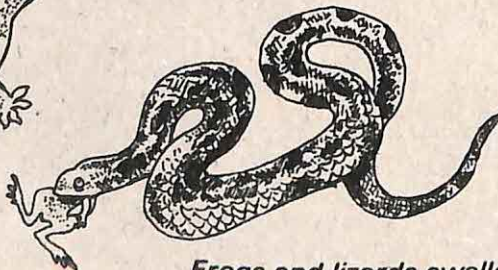
*Some cud-chewing animals*





*Carnivores use their muscles in attack*

Carnivorous animals have strong, powerful body muscles to attack their prey. They also have sharp claws to tear the skin and flesh of their prey. They lie in wait for their prey, and pounce and attack suddenly. The prey is killed and eaten. Apart from eating flesh, they also suck the blood of their prey. Some animals like snakes, lizards and frogs, swallow their food whole. They have minute teeth for holding the prey before swallowing. Snakes swallow animals bigger than themselves. Frogs and lizards catch insects with their sticky tongue and swallow them.



*Frogs and lizards swallow insects*



## Things to remember

1. Animals are grouped according to their feeding habits. They are called herbivorous, carnivorous and omnivorous animals.
2. Herbivorous animals eat plants. Carnivorous animals eat flesh. Omnivorous animals eat both plants and animals.
3. Herbivorous animals have biting or cutting teeth in the front and chewing or grinding teeth at the back.
4. Some herbivores are cud-chewing animals.
5. Carnivorous animals have sharp, curved teeth for tearing the flesh of their prey. Their teeth are strong enough to break even the bones of their prey.
6. Omnivorous animals have all these three types of teeth for biting, chewing and tearing their food.
7. Some animals have special mouth parts for sucking liquid food.
8. Leech, mosquito and bug suck blood of animals. Butterfly and moth suck nectar from flowers.
9. Snakes, lizards and frogs swallow their food whole without chewing.

## Things to do

1. Watch a cow or a buffalo chewing its cud. Watch its jaw move while doing this.
2. Watch how a cat catches a mouse. See how it pounces on it suddenly and catches it with either its teeth or its claws. See how it eats its prey.  
If you have a pet cat, watch it licking its milk. Not even a drop is spilt or wasted.
3. If you have a pet dog, watch it eating its biscuits and bones. Note how well the teeth and the jaws are made for breaking bones! Also watch a pup licking milk. See how it licks it noisily, spilling milk all round the bowl.

## FOR YOUR CLASS DISPLAY BOARD

Collect pictures of animals which show their feeding habits. Group them as herbivores, carnivores, and omnivores. Stick them on chart paper. Label them and display them well.



## Exercises

1. Answer the following briefly:
  - a. What are cud-chewing animals?
  - b. Why do they chew the cud?
  - c. Name the three types of teeth of animals.
  - d. Which animal has a proboscis? Why?
  - e. What does a leech use to puncture the skin of animals? Why does it do so?
  - f. What kind of teeth do herbivores have?
  - g. What kind of teeth do carnivores have?
  - h. Which animals swallow their prey without chewing it first?
2. Mention the use of the following:
  - a. an elephant's trunk.
  - b. the sharp teeth of a cow.
  - c. the long, slender legs of a giraffe.
  - d. the sharp, curved teeth of a lion.
  - e. the sticky tongue of a frog.
3. Match the following:

a. leech	tender shoots
b. deer	milk
c. pup	blood
d. elephant	bone
e. dog	palm leaves.

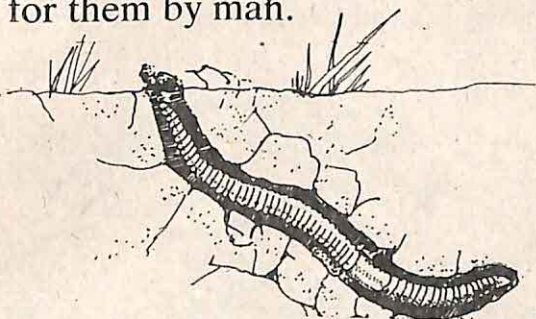


## 5. Animal homes

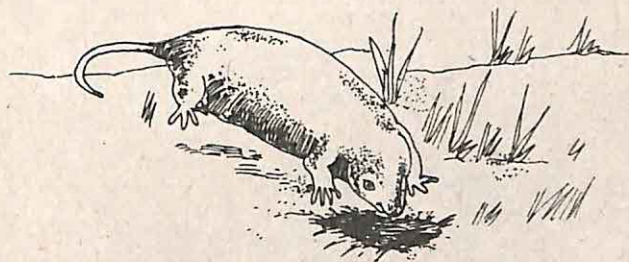
We need houses to live in and to protect us from heat and cold, rain and snow. Animals, too, need homes for the same reasons and to protect themselves from their enemies.

Do all animals build their own homes? No. Only a few animals are capable of building their own homes. Some wild animals like lions and foxes make their homes in natural shelters like caves or dens in mountains. They remain sleeping there during the day when they cannot hunt.

Domestic animals, like the dog, the pig, the cow, live in homes built for them by man.

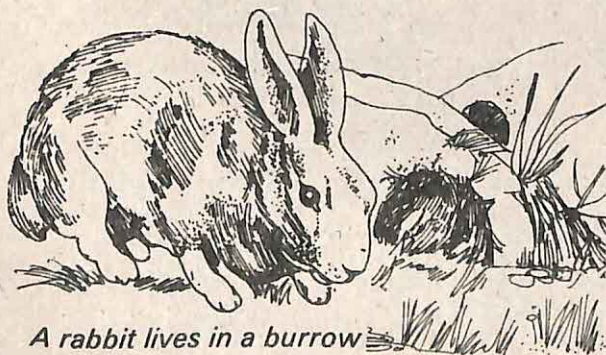


*Some animals live under the ground*



### **How do animals make their own homes?**

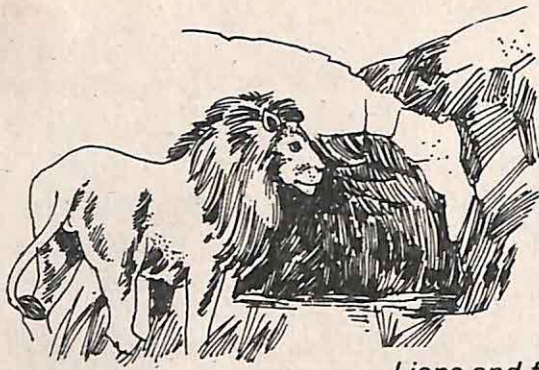
An earthworm digs tunnels in the soil and burrows itself in the earth. A mole is another burrowing animal. It digs the soil quickly with its strong claws, makes a hole and lives there. Its claws are specially meant for digging.



*A rabbit lives in a burrow*

Rabbits live in tunnels made by other animals. They make beautiful nurseries under the ground, using leaves and fur for making warm beds for their babies. A place with many such rabbit-holes is called a warren. A warren has inter-connected tunnels.

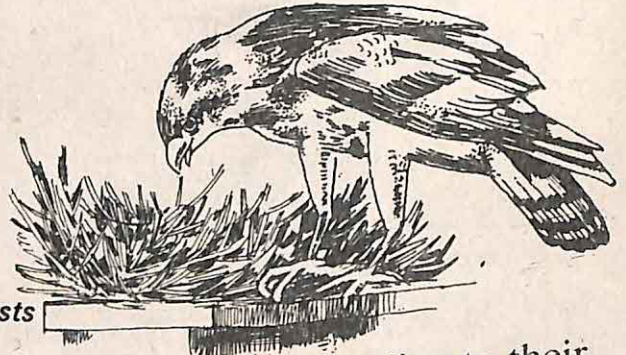




*Lions and foxes live in dens*

Lions and foxes live in dens. Like other wild animals, they choose natural shelters.

Birds live in nests which they build themselves. They use their beaks and claws for building their nests. They generally choose places where they cannot be disturbed or attacked by other animals.



*Birds live in nests*

Different birds have different kinds of nests, built according to their habits. An eagle builds its nest on the top of a tall building or tree, because it flies high. A kingfisher builds its nest in a funnel-like hole on the banks of rivers, lakes and ponds. Can you give the reason for this?



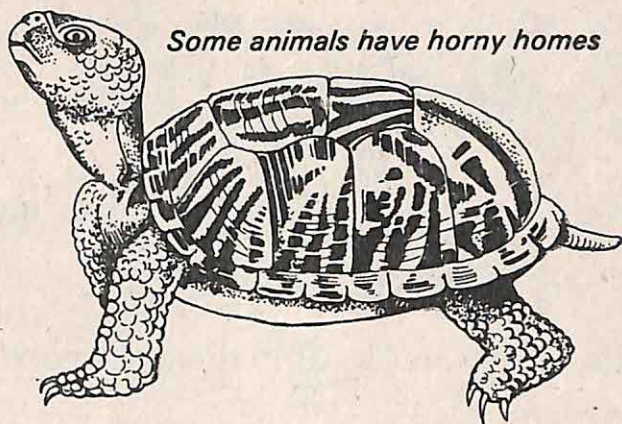
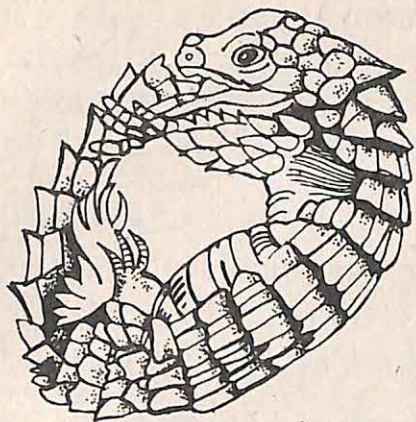
*A kingfisher's funnel nest*



*A snail's body is its home*

Some animals have their home on their own bodies. For example, a snail has a coiled shell. When it senses danger, it pulls itself quickly into the coiled shell and hides.





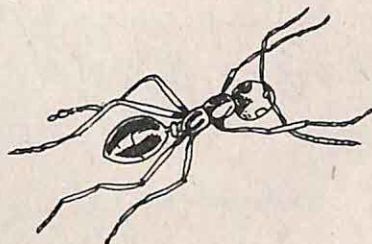
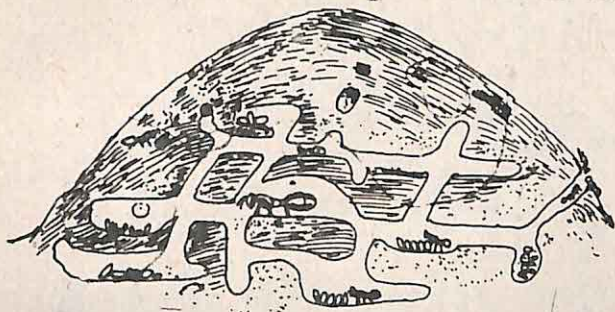
*Some animals have horny homes*

An armadillo has a body covering made of horny scales. It tucks its head, tail and legs into this scaly home and folds it up.

Turtles and tortoises have bony cases into which their head, tail and legs are drawn.

### **Colonies of animals**

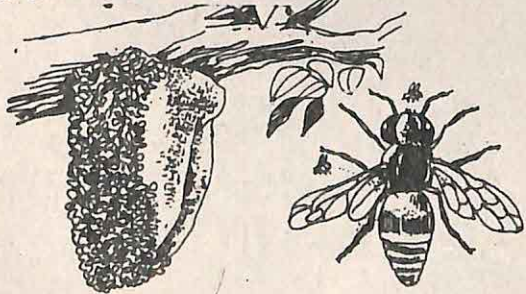
Ants, bees and wasps are social insects which live in colonies.



*Ants live in colonies*

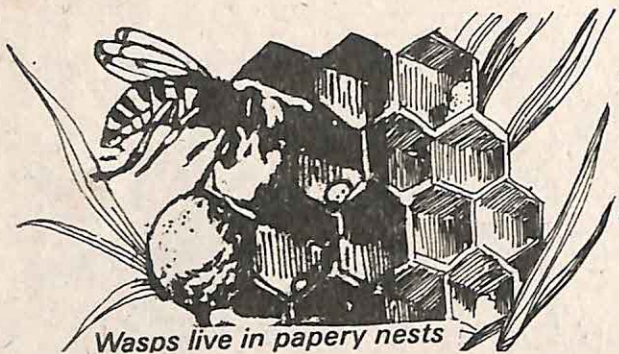
Tiny ants build huge ant-hills with many tunnels made of mud. In each ant-hill three different kinds of ants can be seen — the queens, the males and the workers. Each of them help in making a successful home. Ants store food in the tunnels or holes for future use.

*A bee lives in a honeycomb*



Bees build honeycombs made of beeswax. Honeycombs can be seen hanging from rocks in mountains or from branches of trees. Bees store honey in the cells of the honeycomb. Like ants, bees are also of three kinds.





*Wasps live in papery nests*

Wasps build papery nests. These social insects lay eggs in special nurseries in their colonies and take good care of their young.

### **Man-made homes of animals**

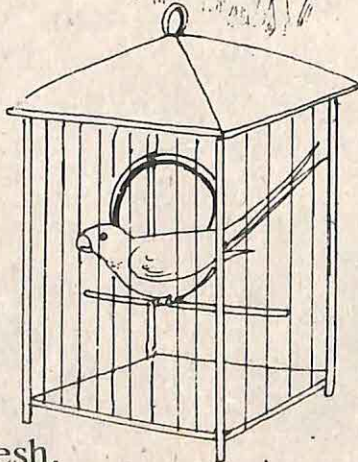
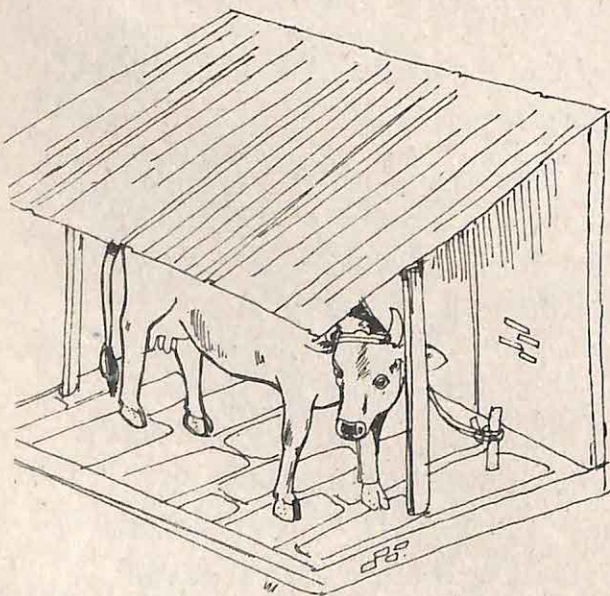
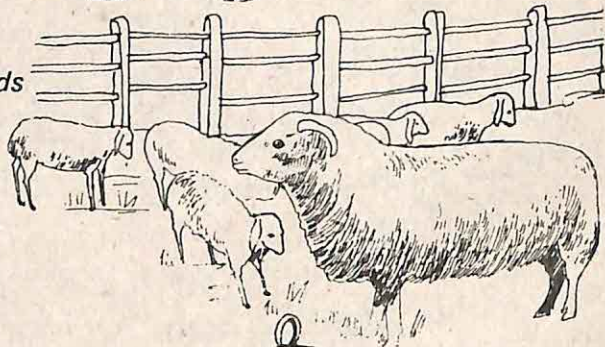
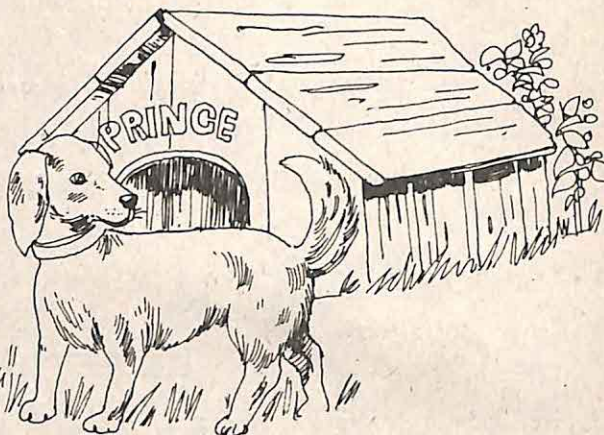
When man builds tall towers of temples, churches and mosques, the spaces he leaves in them are good nesting places for parrots and pigeons.

Pet dogs sometimes have wooden kennels built for them to live in.

Wooden or metal cages are built for pet rabbits, white mice and birds like parrots and budgerigars.

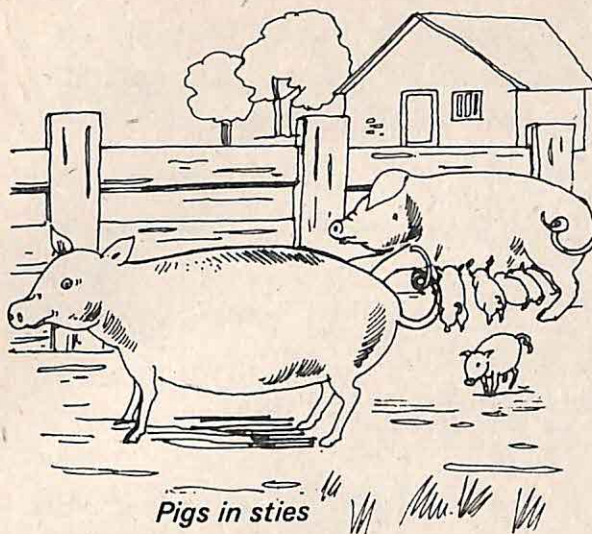
Horses live in stables pigs in sties and cows and buffalos in sheds.

*Different homes for animals and birds*

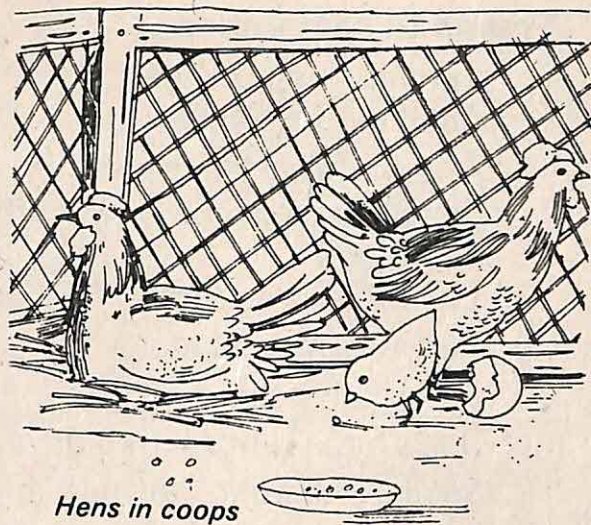


Hens are kept in coops made of wire-mesh.



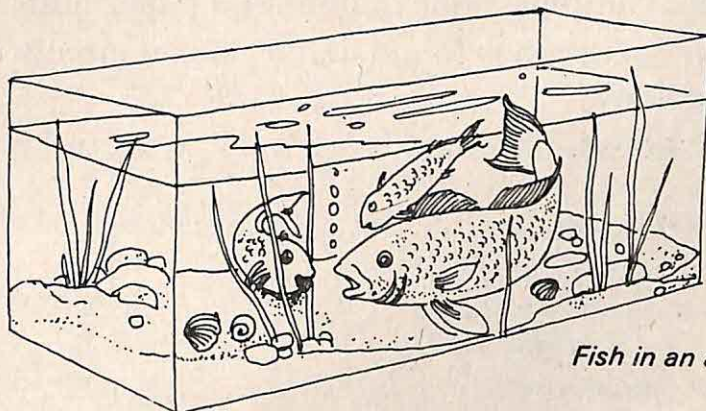


*Pigs in sties*



*Hens in coops*

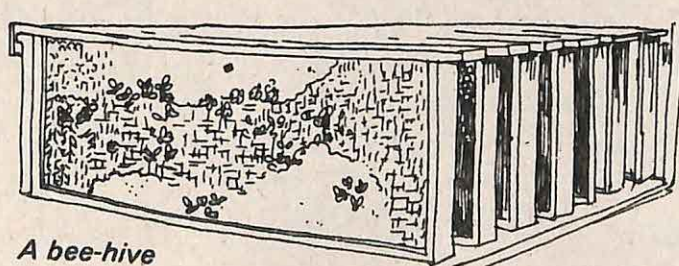
Fish live in an aquarium along with small water plants like hydrilla.



*Fish in an aquarium*

Bees live in bee-hives. Bees collect honey in the bee-hives.

These animal-homes are kept clean and tidy by man. Each home is provided with facilities for keeping food and water and for waste matter to be removed. Eggs can also be removed from coops without even opening the coop door.



*A bee-hive*

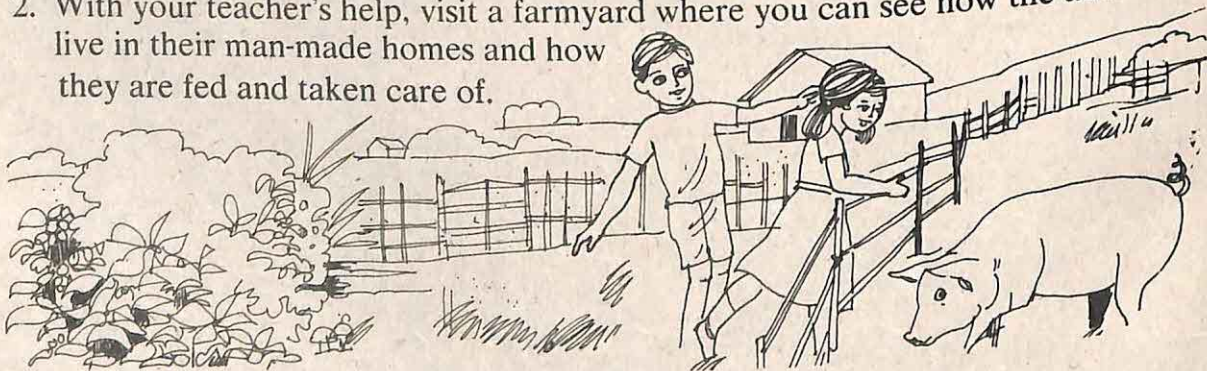


## Things to remember

1. Animals sometimes live in natural homes, sometimes in homes made by themselves and sometimes in man-made homes.
2. Animals need their own homes for living in and to protect themselves against bad weather and from their enemies, just as man does.
3. Lions, foxes and other wild animals live in natural caves or dens.
4. Earthworms and moles dig their own tunnels.
5. Moles have sharp claws for digging holes in the mud.
6. Birds build different kinds of nests.
7. Snails, armadillos, turtles, and tortoises, use their scaly backs as homes.
8. Ants, bees and wasps are social insects. They live in special homes called anthills, honeycombs and paper nests respectively.
9. A lot of co-operation is found among social insects which live in the same colony.
10. Man-made houses for animals are built comfortably and are kept clean.

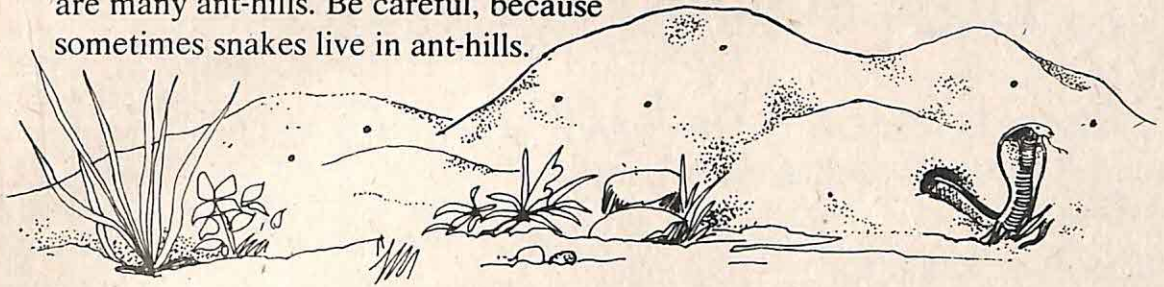
## Things to do

1. If you have a garden, you could try keeping a bee-hive and watch the life-activities of bees. Did you know that the Khadi and Handloom Board will set up a beehive for you, for a small payment, and teach you how to look after it? An adult must be with you to help.
2. With your teacher's help, visit a farmyard where you can see how the animals live in their man-made homes and how they are fed and taken care of.





3. Visit an open field where there are many ant-hills. Be careful, because sometimes snakes live in ant-hills.



#### IN YOUR NOTEBOOK

Draw pictures of man-made houses and paste suitable pictures of animals in each of them.

#### FOR THE CLASS DISPLAY BOARD

Bring pictures of the natural homes of animals, paste them neatly on a sheet of chart-paper, label them and put the chart on the display board.

### Exercises

1. Match the animals with their homes:
 

a. fox	nest
b. fish	stable
c. bird	den
d. pig	aquarium
e. horse	papery nest
f. fowl	sty
g. bee	ant-hill
h. wasp	kennel
i. snake	coop
j. dog	honeycomb
2. Pick out the stranger:
  - a. kennel, sty, bird's nest, coop
  - b. honeycomb, bee-hive, den, **papery nest**
  - c. earthworm, mole, rabbit, lion
  - d. ants, wasps, flies, bees
  - e. turtle, elephant, snail, armadillo
3. Who am I?
  - a. I build papery nests. I live in a colony. I am a .....
  - b. I dig my own tunnel. I have sharp claws. I am a .....
  - c. I cannot build my own home. I live in ant-hills. I am a .....
  - d. I make my home with wax. I store honey. I am a .....
  - e. I carry a coiled shell on my back. I am a .....



## 6. Flight of birds

You see different kinds of birds everyday. You can see how a bird makes use of its various body parts.

What is it that makes a bird different from other animals? The difference is that they have wings.

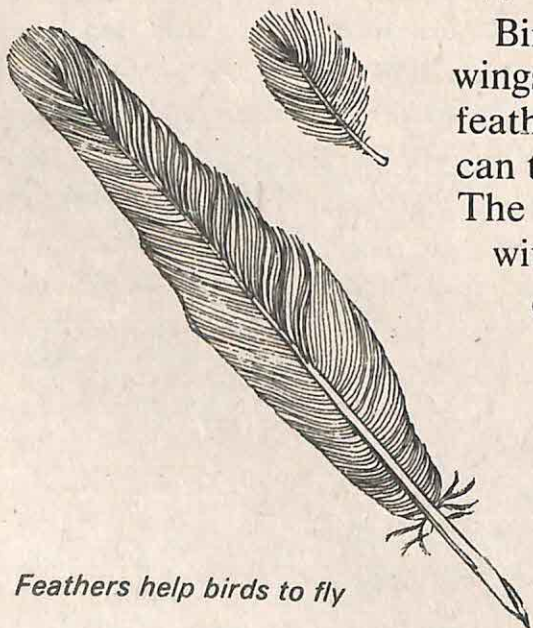
Birds are animals with wings. Just like other animals have hair or fur, birds have feathers covering the entire body excepting the beak and the claws.

### How do we recognise birds?

Do all feathers look alike? Certainly not. Some of them are small and fluffy. Some others are long. Even the colours of feathers in different parts of the body are not the same. However, whatever the differences may be, the type of feathers, the shapes of beaks and claws and the nature of calls are the things that help us to recognise birds. Can you recognise unusual bird-calls?

### Types of feathers

Birds have long feathers covering their wings and tail. These are the flight feathers. To change their direction, birds can turn their tail feathers left or right. The remaining body parts are covered with soft, fluffy, short feathers called down feathers. Down feathers also occupy spaces between the flight feathers. There is yet another type of feather birds have called filoplumes. As the name suggests, flight feathers help birds to keep flying in the right direction.



*Feathers help birds to fly*

The down feathers and the filoplumes keep the bird warm.

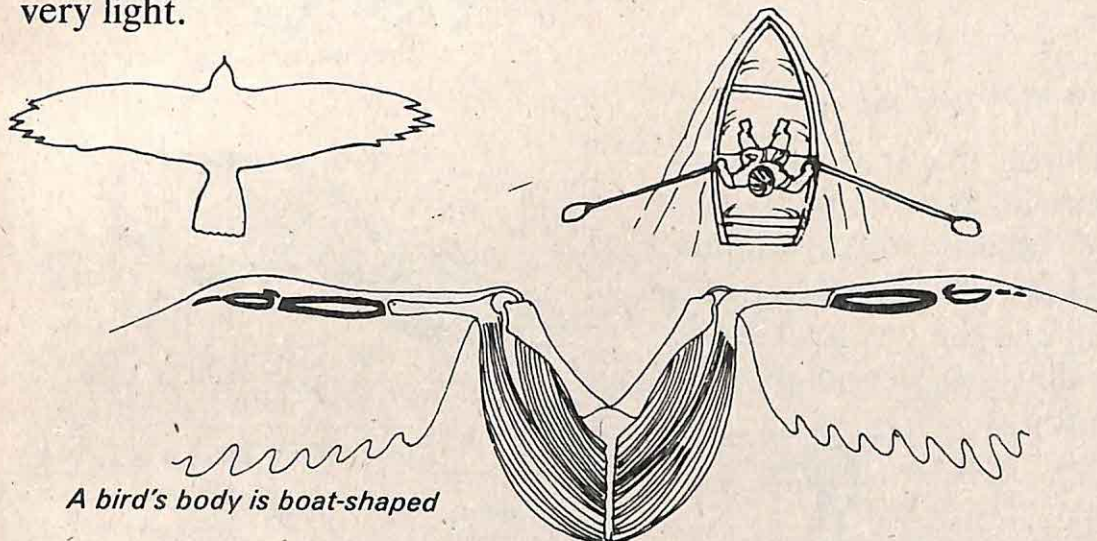


## Structure of feathers

Take a feather and hold it against the light and look at each part carefully. What do you see?

Each feather has a thin, long, hollow shaft. It is slightly broader at the base and very narrow at the top. The shaft is provided with thin hairs on either side hooked firmly to the one above and the other below.

Why is the shaft hollow? It is filled with air to make the feather very light.



## Various body parts suitable for flight

Are feathers and wings alone enough to make a bird fly in the air? If not, what other parts of a bird's body help in its flight?

The shape of a bird's body is like a boat. Its chest bones are shaped like a boat. The beak and tail are pointed. This shape of a bird's body helps it to steer itself through air just as a boat steers through water.

Unlike the bones of animals which are heavy, birds have light, hollow bones filled with air. This makes the body very light. The wings are attached to strong chest muscles. This helps a bird to fly over long distances without getting tired.

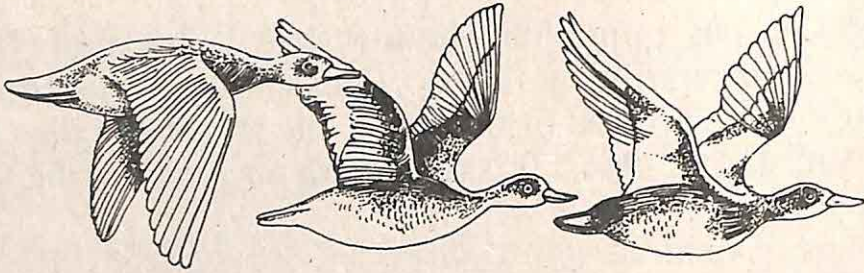
Thus birds have specially designed bodies well suited to flying.

## Flight of birds

Birds flap their wings very fast so that the air can lift them up when they fly. They fold their wings while they fly. When they land, they lower their wings and legs.

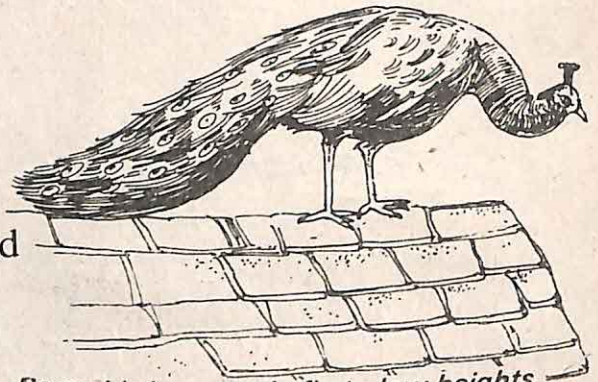


Some birds like wild ducks and geese fly over long distances. Such birds fly very high, sometimes well above the clouds. Long ago, pigeons were used for carrying letters to distant places.

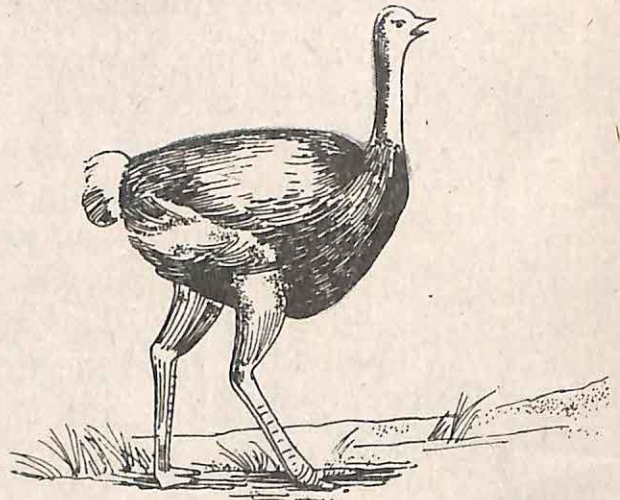


*Some birds fly long distances*

Some birds like sparrows, fowl and partridges can only fly very short distances and at very low heights. The bodies of birds like the hen and the pea-fowl are so heavy that they cannot go up beyond a roof-top!



*Some birds can only fly to low heights*

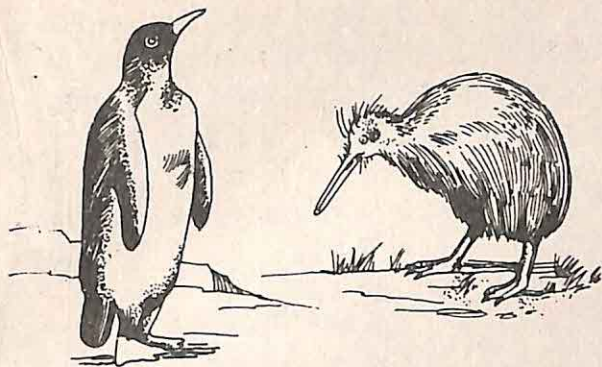


*The ostrich and the emu are flightless*

### **Flightless birds**

Some birds like the ostrich and the emu do not have hollow bones and their muscles are not strong. Their body is very big. So these





birds cannot fly. They are called flightless birds. The kiwi, though small, is also a flightless bird. Penguins, which are expert swimmers, cannot fly.

*The penguin and the kiwi cannot fly*

### **Things to remember**

1. Birds are animals with wings.
2. The feathers of birds help them in flight and keep them warm.
3. Feathers are of three types-flight feathers, down feathers and filoplumes.
4. Birds have different things that help them in flight
  - a. boat-shaped bodies for steering them in flight
  - b. light feathers
  - c. hollow bones filled with air
  - d. strong chest muscles that help the wing to flap very fast
  - e. tail feathers that turn left or right and help the bird in changing the direction of flight.
5. Birds like ducks and geese fly at great heights and over long distances.
6. Birds like sparrows and hens can only fly very low.
7. Heavy birds like hens and pea-fowl can fly only to very short height, say upto a roof-top.
8. Flightless birds have heavy bones and heavy bodies. Ostriches, emus, kiwis and penguins are flightless birds.
9. The calls of birds differ from one another. For example,
  - the crow caws
  - the sparrow chirrups or twitters
  - the owl hoots
  - the tailor-bird whistles.



the hen clucks  
the cuckoo coos  
the turkey gobbles

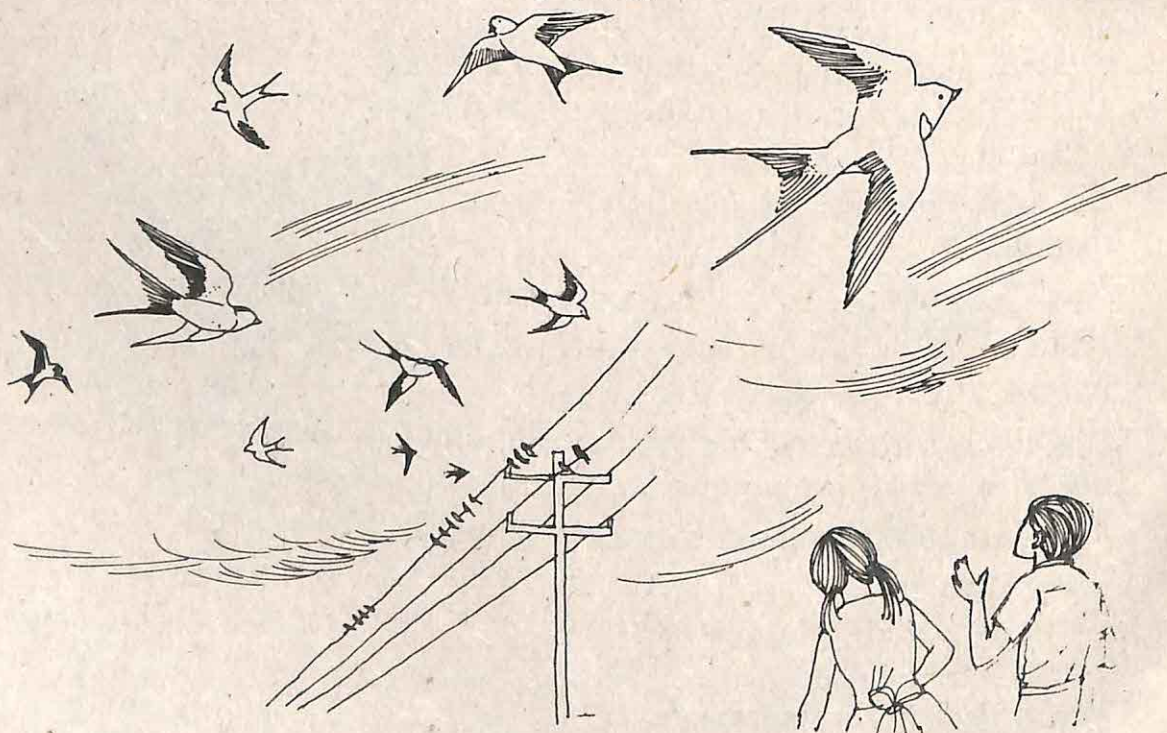
### Things to do

#### 1. FOR YOUR CLASS DISPLAY BOARD

1. Collect flight feathers, down feathers and filoplumes. Paste them on a sheet of chart paper and label them. Sketch them with your pencil in the same chart, if you can. Display this on your class display board.
2. Collect feathers of various colours, shapes and sizes. Can you tell what birds they come from? Paste them on a big chart paper, label them and display them on the display board.

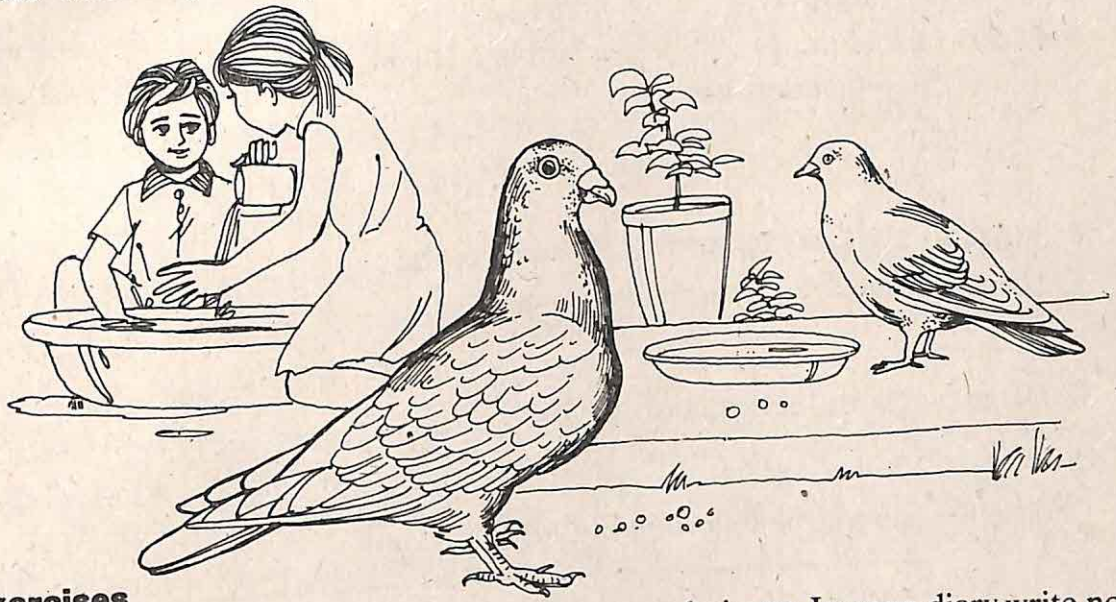
#### HOBBY ACTIVITIES

1. Get used to watching birds early in the morning and in the evening. Notice their colour, body shape, shapes of beaks and claws, nature of calls. Very soon you will be able to identify them. You can recognise them even by their calls. You will soon realise that bird-watching is a wonderful hobby. Remember to make a note in your diary of all that you see.



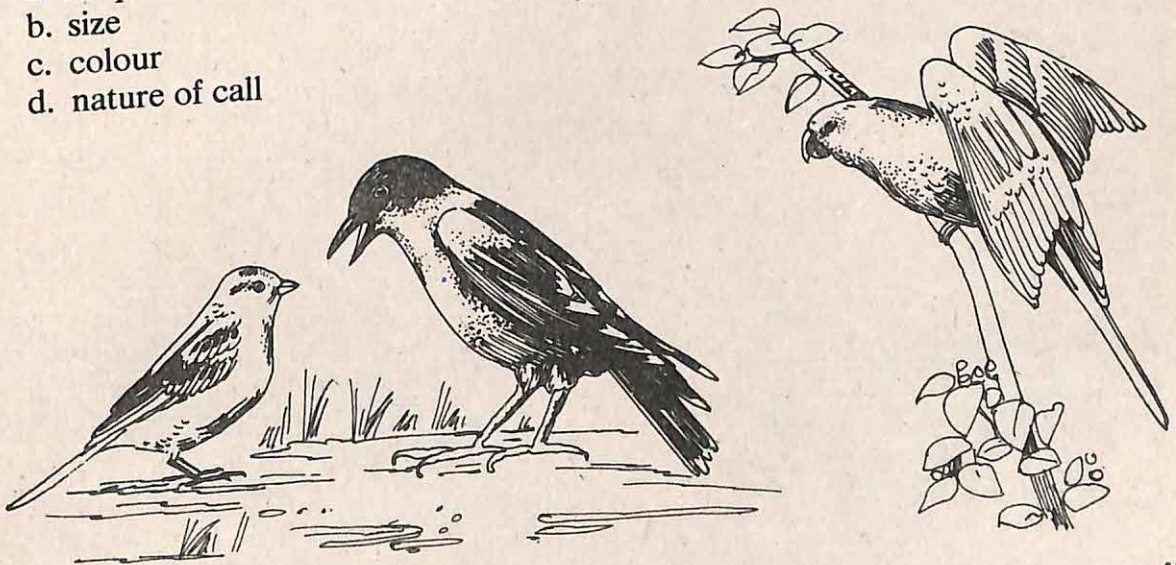


2. When you travel in a train, or a bus or a car, make it a point to watch birds in their flight. Also look for them in paddy fields, ponds, tree branches and on lamp posts and telegraph wires. Try to identify them.
3. Keep a bird bath, a bird table and a bowl of water in a suitable place in your house or if possible, even your school. You will soon know how friendly birds are when they know you well. You will also learn about their habits.



### Exercises

1. Watch common birds like the crow, sparrow and pigeon. In your diary write note about each of them under the following heads. Then copy them in your notebook with a diagram for each bird.
  - a. shape of the body
  - b. size
  - c. colour
  - d. nature of call





- e. shape of beaks and claws, size of beak and nature of claws.
  - f. colour of the eyes.
  - g. nature of movements on land, in water and in air.
  - h. nature of feeding, types of food.
  - i. any interesting behaviour.
2. Answer the following very briefly.
- a. Name the various types of feathers.
  - b. Make a list of things that help a bird in its flight.
  - c. Name three flightless birds.
    - i. ....
    - ii. ....
    - iii. ....
  - d. What are the body features of flightless birds?
  - e. Name any two birds that fly very high.
    - i. ....
    - ii. ....
  - f. Name two birds that can only fly low.
    - i. ....
    - ii. ....
3. Choose the call for the following birds from the box.

hoots,	whistles,	caws
chirrup,	clucks	

Name of bird	Nature of call
a. crow	.....
b. owl	.....
c. hen	.....
d. tailor-bird	.....
e. sparrow	.....



## 7. Beaks and claws of birds

You have learnt that animals have different types of teeth suitable for their feeding habits.

When you see the beak of a bird, you can guess the type of food it eats. Its claws can tell you a lot about its habits.

Beaks of birds tell us all about the kind of food birds like to eat and how they manage to get their food. We also get to know how beaks help them to protect themselves.

Birds eat different kinds of food such as seeds and grains, flesh, honey, nuts, fish, small worms and insects.

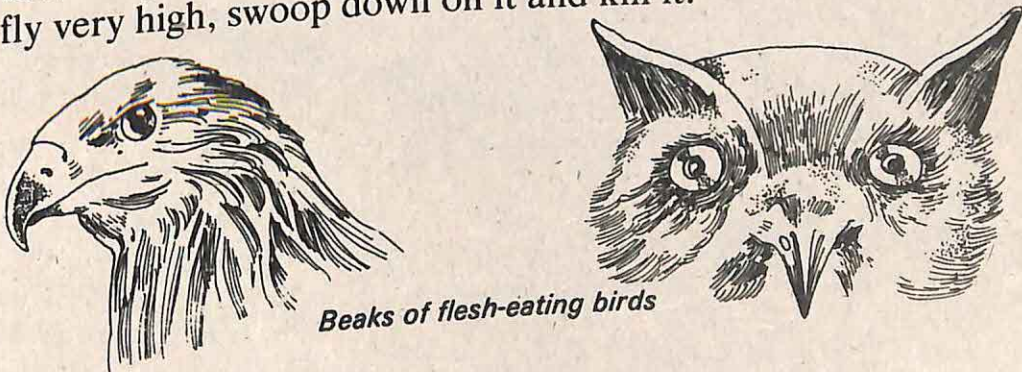
### Types of beaks

1. Seed and grain-eaters: Sparrows, pigeons, weaverbirds, peacocks, etc. have short, hard, horny beaks for cracking seeds. You can see a sparrow cracking seeds in your own house. They remove the husk and swallow the seeds.



*Beaks of seed and grain-eaters*

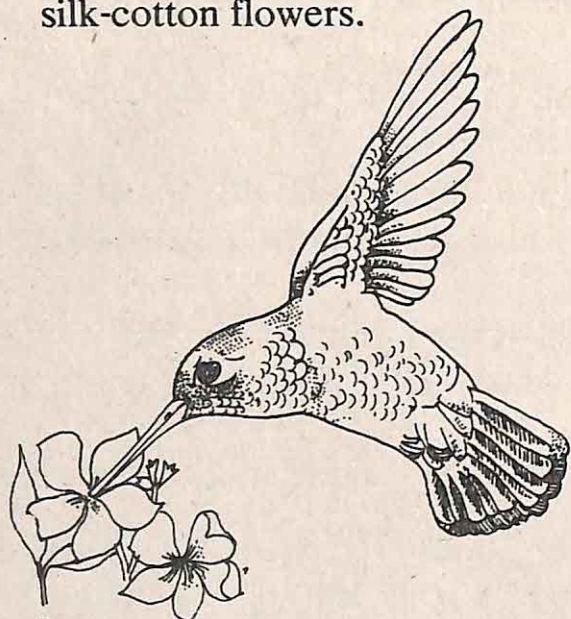
2. Flesh eaters: Eagles, vultures, owls, hawks, etc. are flesh eaters. They have hard, sharp and curved beaks for tearing the flesh of small animals and birds on which they feed. They have very keen eyes too. They can easily spot an animal moving on the ground as they fly very high, swoop down on it and kill it.



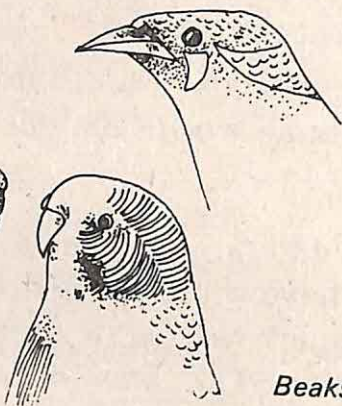
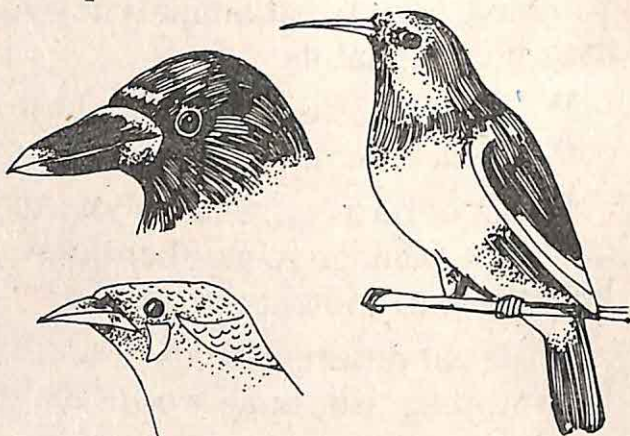
*Beaks of flesh-eating birds*



3. Honey-suckers: Hummingbirds and sunbirds have slightly curved, straw-like thin beaks for sucking nectar or honey from flowers. Crows, mynahs and golden orioles are also honey-suckers. You can see crows and mynahs fighting with squirrels to suck nectar from silk-cotton flowers.



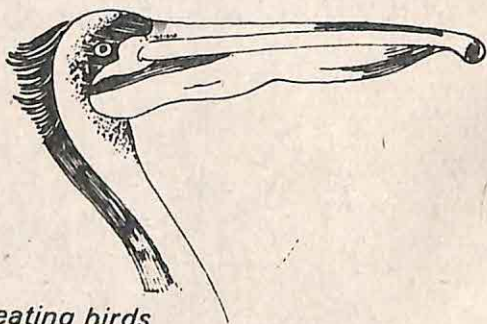
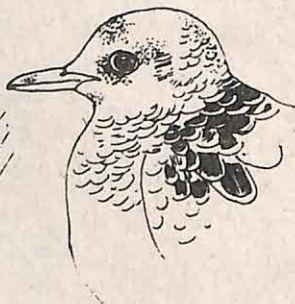
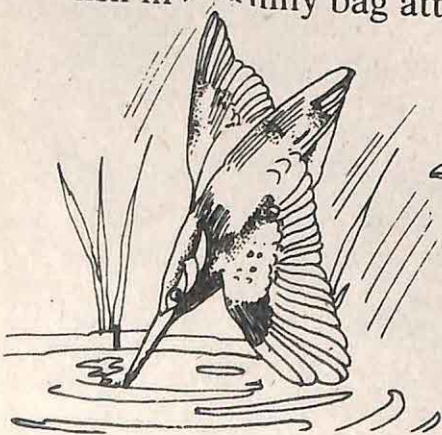
*Beaks of honey-suckers*



*Beaks of nut-crackers*

4. Nut-crackers: Parrots and budgerigars have hooked beaks for cracking nuts and seeds. It is very interesting to observe that unlike other birds, the parrot moves its upper beak. (Which jaw do you move?)

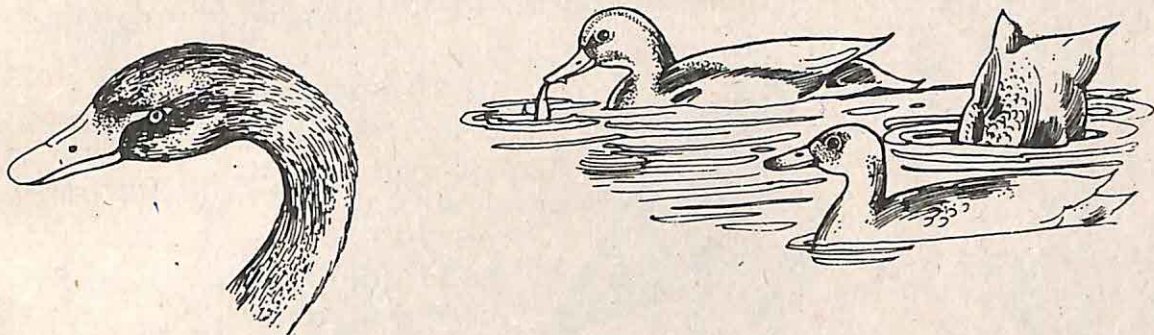
5. Fish-eaters: Kingfishers, pelicans, gulls, etc. have long beaks for catching fish. They are also expert divers. The pelican can store fish in a skinny bag attached to its beak. Paddy birds have long



*Beaks of fish-eating birds*

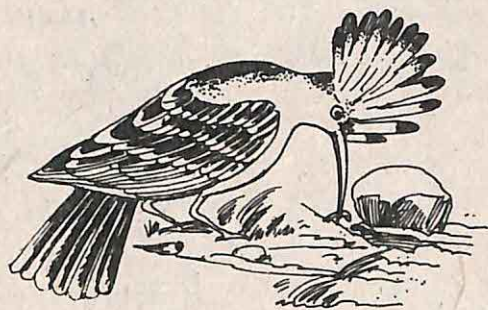
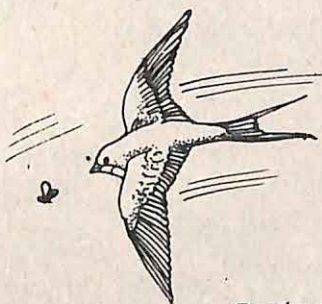


beaks and long necks. They pull out tadpoles and frogs from muddy waters and swallow them.



*Long necks help water birds*

6. Flat beaks with strainers: Ducks and swans have flat beaks with strainers. Ducks use their flat beaks for shovelling up the muddy water in a pond. The flat beak has strainers along the edges which look like rows of tiny teeth. They allow mud and water to run out from the beak, trapping tiny worms and waterplants within its mouth. After straining out the mud and water, the duck swallows its food.



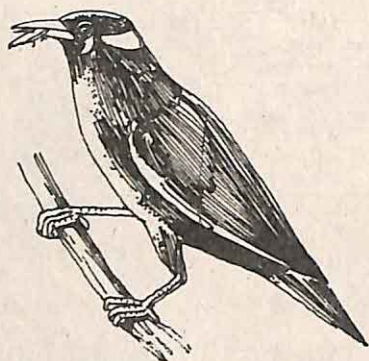
*Beaks of insect-eating birds*

7. Insect-eaters: Swallows are small birds with soft, broad beaks. Their mouths and tongue are very sticky. Soon after sunset, you can see swallows flying very low around street lights, snapping up mosquitoes with their wide and sticky mouths, keeping them wide open as they fly.

A hoopoe has a pincer-beak for pulling out insects from their hiding places, such as holes in the ground.



A woodpecker has a strong and heavy beak for hammering and pecking at wood. It taps the bark of a tree to find out whether any insect larvae or insects are hiding underneath. Then it chips off the bark and swoops up the hiding creatures with its long, sticky tongue.



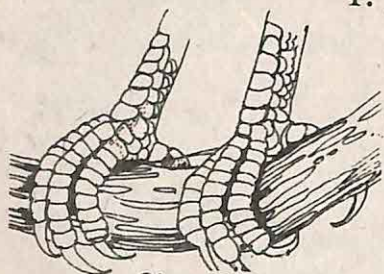
*A woodpecker and a mynah*

A mynah is an expert insect-catcher. It uses its long beak for this purpose.

Just as we come to know of feeding habits of birds from their beaks, their claws (feet) can tell us where and how they live.

### **Types of claws**

1. **Perchers:** Crows, sparrows, etc. perch comfortably on tree branches using their long, slender toes. If you watch carefully, you can see three toes in front and one behind which curl round the branch. Nightingales and skylarks, which sing so sweetly, are also perchers.

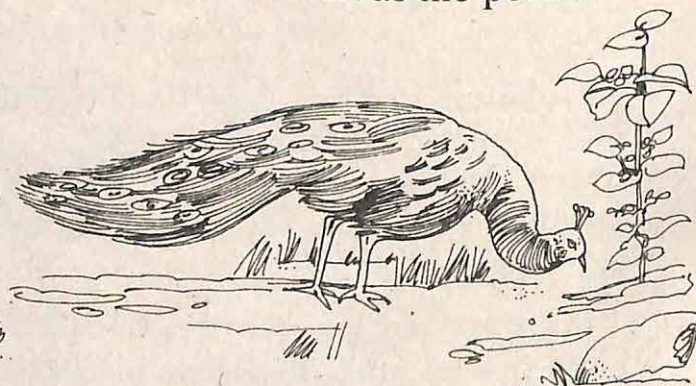


*Claws of perchers*

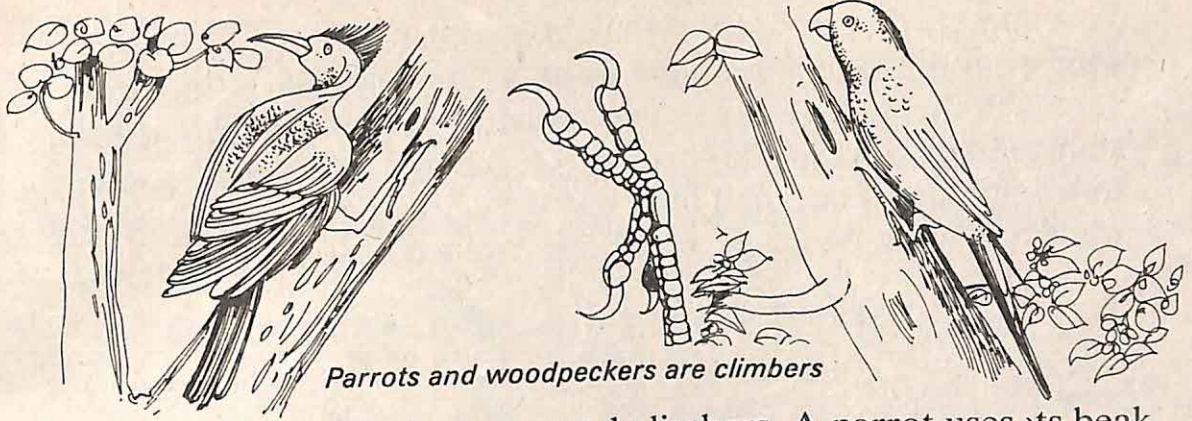
2. **Scratchers:** Domestic fowl and pea-fowl are seed and grain eaters which scratch mud with their strong horny claws. They have three toes in front and a short hind toe which is higher up the leg. Scratchers cannot perch on tree branches as well as the perchers do.



*Claws of scratchers*

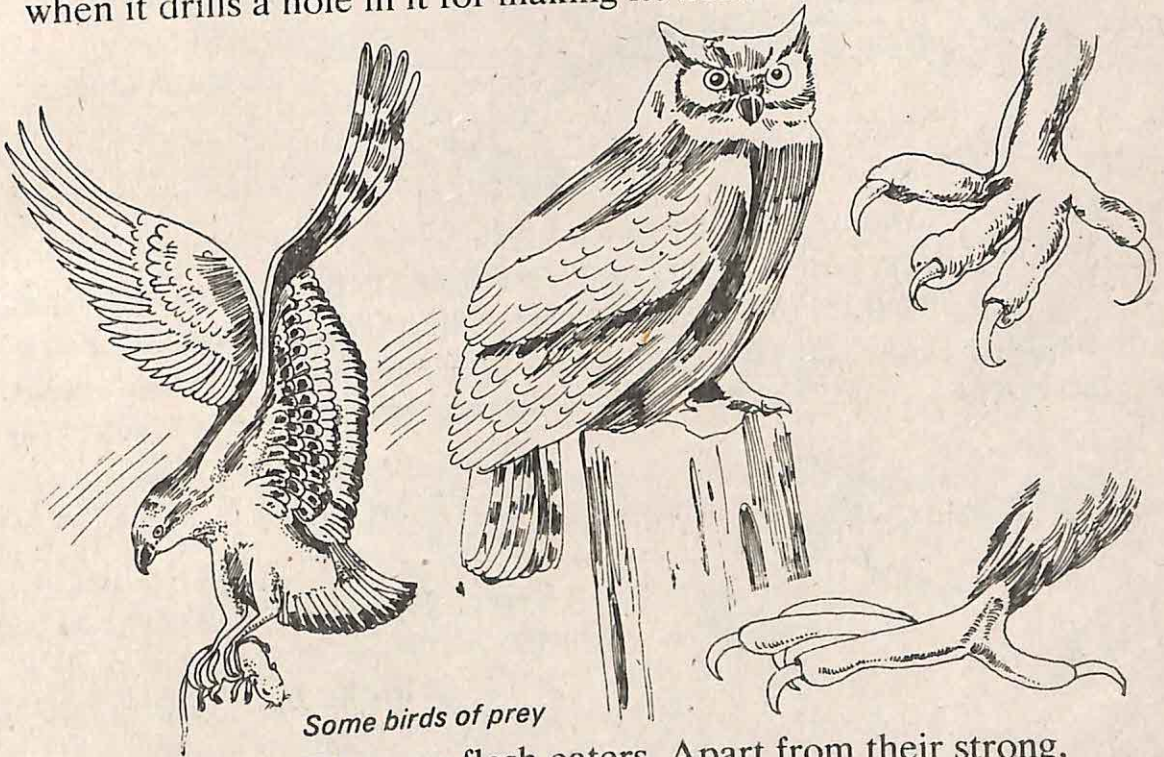






*Parrots and woodpeckers are climbers*

3. Parrots and woodpeckers are good climbers. A parrot uses its beak also for climbing. Climbers have two toes in front and two behind. Their toes help them to balance while climbing on tree trunks. They also help a woodpecker to hold on to the bark of a tree trunk when it drills a hole in it for making its nest.

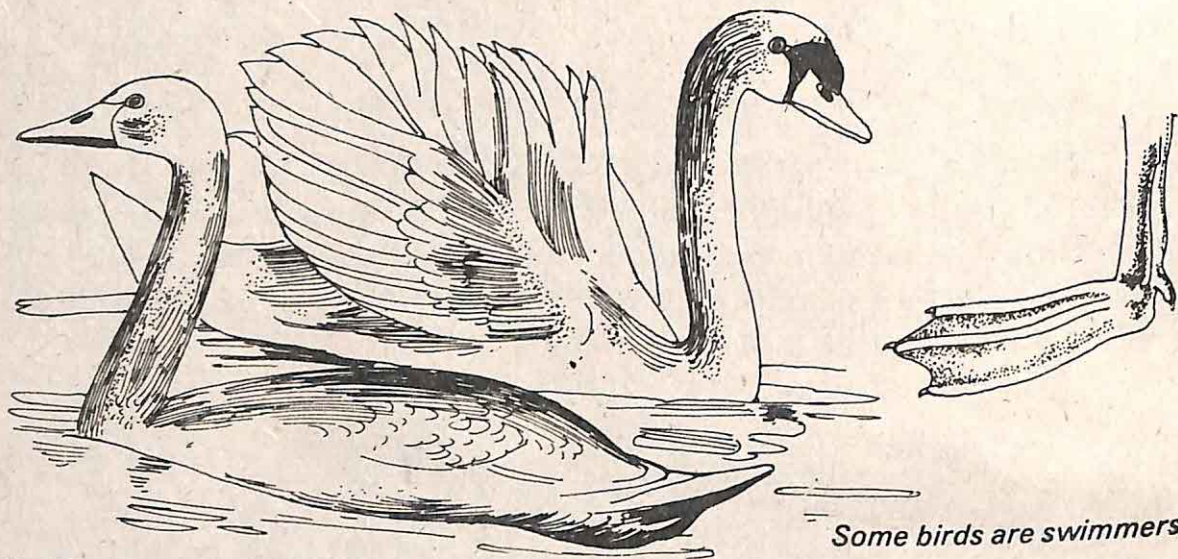


*Some birds of prey*

4. Birds of prey: They are flesh eaters. Apart from their strong, curved beaks, they have strong, horny and curved claws for tearing the flesh of their prey. They have three toes in front and one *behind just like perchers*. They use their toes for carrying away their prey. *Hawks, owls, eagles, vultures, etc. are birds of prey.*

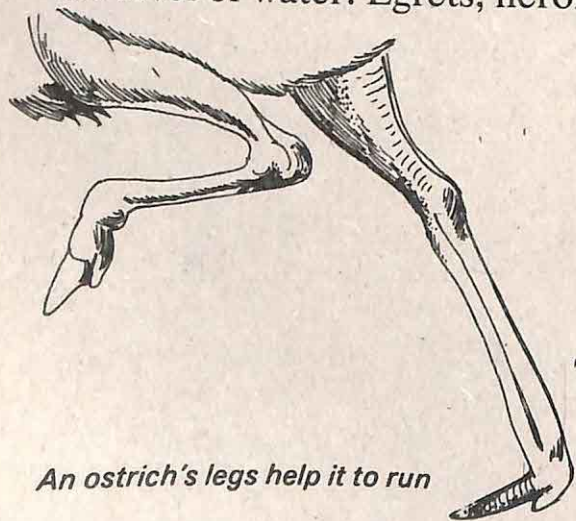


5. **Swimmers:** Many water birds have waterproof feathers and webbed toes which help them to swim in water. They have oil glands in their skin to keep the feathers waterproof. The webs of skin spread between the three front toes and are used as paddles for swimming. The small hind toe is slightly higher up the leg and is useless. Ducks, pelicans, swans, etc. are expert swimmers.



*Some birds are swimmers*

6. **Waders:** Waders are also water birds. They wade through muddy shores, ponds, rivers and sometimes even the sea with their long legs and thin, outspreading toes. These thin toes never get caught in the soft mud. Their long legs keep their body well above the level of water. Egrets, herons, sandpipers, etc. are waders. You



*An ostrich's legs help it to run*

can see a paddy bird or pond heron move about freely on the muddy banks of a pond with its long, graceful legs and spread-out toes, three in front and a small hind toe at the back, a little above the rest of them.

7. **Runners:** The ostrich is a runner. It has very long and strong legs for running. It has only two toes. Its heavy, cushion-like toes

do not sink into the desert sand as it runs fast.



## Things to remember

1. Birds have different types of beaks which help them to catch and eat different kinds of food.
2. Their legs and claws are well-suited for their method of living.
3. By observing the beak and the claws of a bird, we can find out what type of food it eats, where and how it lives.
4. There are seven types of beaks and claws. They are:

### Types of beak

- a. seed-and grain-eaters
- b. flesh eaters
- c. honey suckers
- d. nut crackers
- e. fish eaters
- f. flat beak with strainers
- g. insect eaters

### Types of claws

- a. perchers
- b. scratchers
- c. climbers
- d. birds of prey
- e. swimmers
- f. waders
- g. runners

## Things to do

### FOR CLASSROOM DISPLAY

1. Try to make models of the beaks of various birds, with plasticine or clay. Look at the figures in the text to make your models. Display them in your classroom with suitable labels.
2. Try to discover the feeding habits and movements of each and every bird you see. Record your observations and conclusions in your class workbook. Can you draw pictures of each of these birds?
3. Collect pictures of birds with different kinds of beaks and claws. Paste them in a chart sheet and name them. Put the chart on the display board.

## Exercises

1. Answer the following briefly:
  - a. How do beaks and claws help birds?



- b. Which part of a parrot's beak moves?
  - c. What are strainers?
  - d. What kind of feather do water-birds have? Why?
  - e. Which birds are famous singers?
  - f. What is the use of the long beak of a paddy bird?
  - g. How does a woodpecker climb on trees?
  - h. How does a duck swim in water?
  - i. What is the difference between a percher and a scratcher?
  - j. Why does a sunbird have a straw-like beak?
2. Match the following:
- |                  |  |
|------------------|--|
| a. waders        | webbed toes  |
| b. perchers      | strong toes, three in front and one behind with horny claws. |
| c. swimmers      | two toes in front and two behind.                            |
| d. birds of prey | thin, outspread toes.  |
| e. climbers      | thin toes, three in front and one behind.                    |
3. Match the types of beaks with the birds:
- |                 |                         |
|-----------------|-------------------------|
| a. hawk         | flat beak with a pouch. |
| b. budgerigar   | strong, curved beak     |
| c. humming bird | long, pointed beak      |
| d. pelican      | tiny, straw-like beak   |
| e. sparrow      | hooked beak             |
4. Pick out the odd one from each group:
- a. woodpecker, mynah, hoopoe, eagle.
  - b. duck, pelican, crane, crow
  - c. crow, parrot, sparrow
  - d. vulture, swan, owl
  - e. paddy bird, pea fowl, domestic fowl.



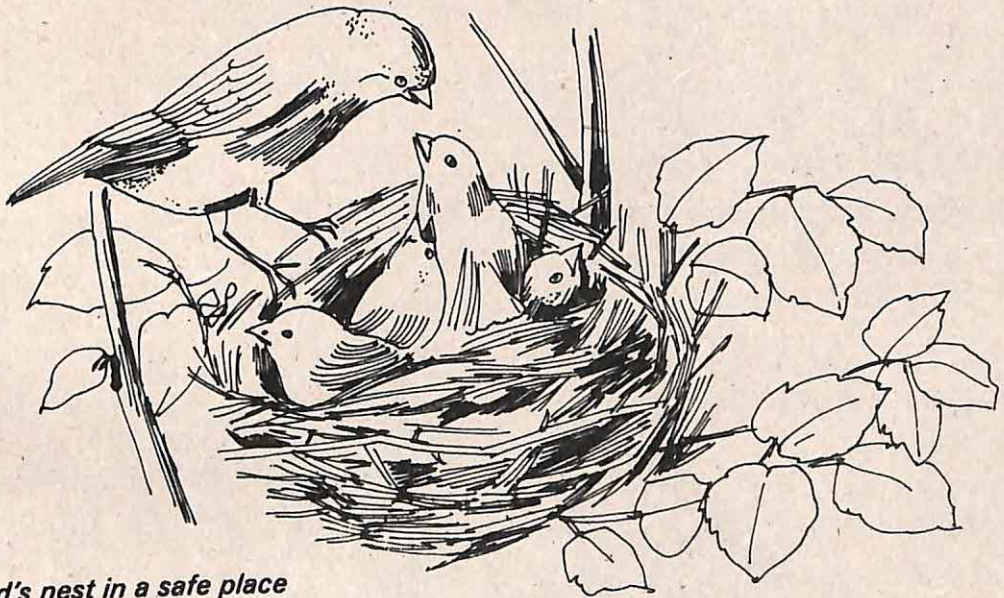
## 8. Nesting habits of birds

Animals, especially birds, get very busy during their breeding seasons. They know that they have to make preparations to keep their young ones safe and warm. They also know that they have to keep their young in specially made homes and feed them well.

Birds are the only animals which build their own nests. In February and March, you find many Indian birds getting busy, collecting materials to build their nests. They also hunt for suitable places to build their nests. Both father and mother birds work together.

It is very interesting to watch birds flying here and there, hurriedly picking up twigs, or pulling out straws. You can see them even carrying tiny feathers and cobwebs in their beaks.

A bird chooses its nesting place out of the reach of all its enemies.

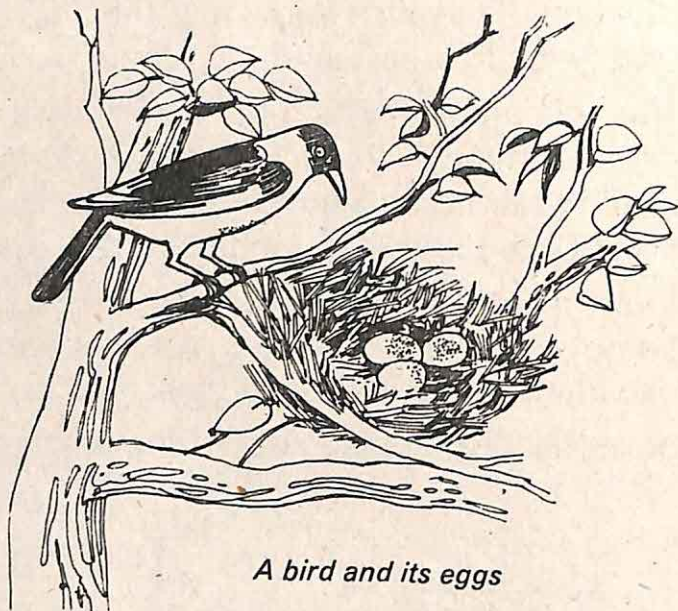


*A bird's nest in a safe place*

For example, the crow chooses the top of tall trees. The sparrow hunts for a corner in the roof of a verandah. The pigeon looks for a hole in a well or in an old building. The bulbul chooses a corner in a bush. The kingfisher makes a tunnel on the bank of a pond. The woodpecker drills its hole in a tree-trunk.



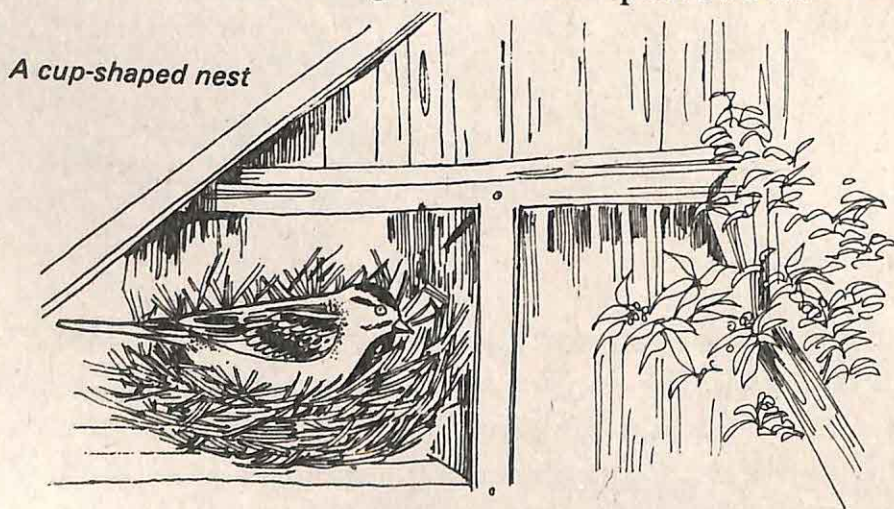
Don't disturb a bird when it is building its nest. You can have a try at looking into the nest once it is built. Are the eggs laid and the young ones hatched? Listen to the squeaky voice of the baby birds. Watch how they are fed by their parents. See how the parents become shabby and tired within a few days, looking after their young ones!



*A bird and its eggs*

### **What type of nests do birds build?**

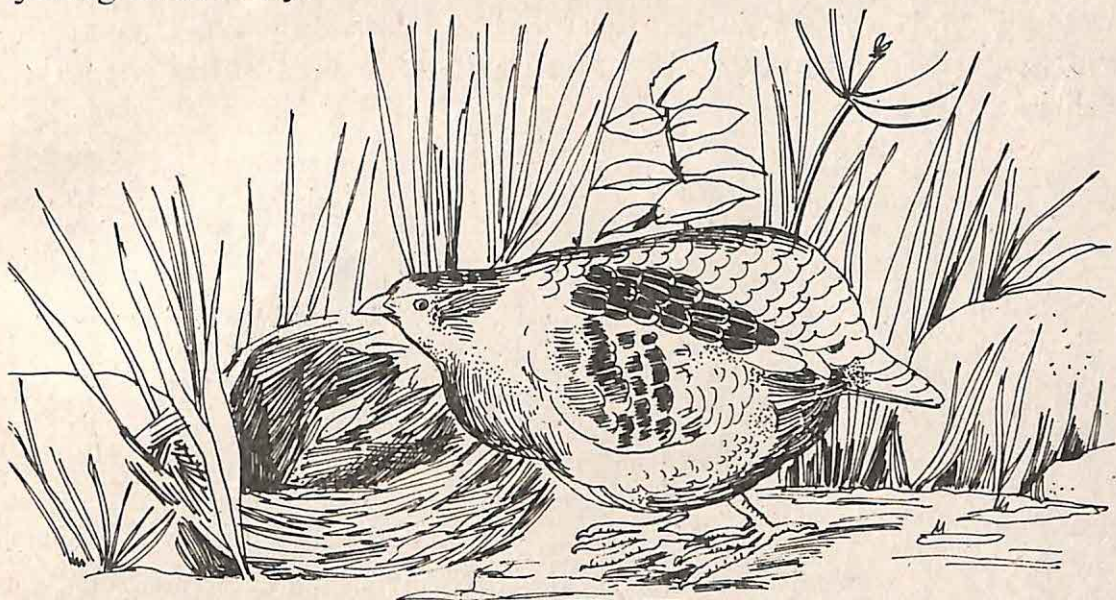
Birds whose young ones are born blind and without any feathers build a deep cup-shaped nest at a great height. This prevents the eggs and the young ones from falling. Crows and sparrows build such nests.



*A cup-shaped nest*

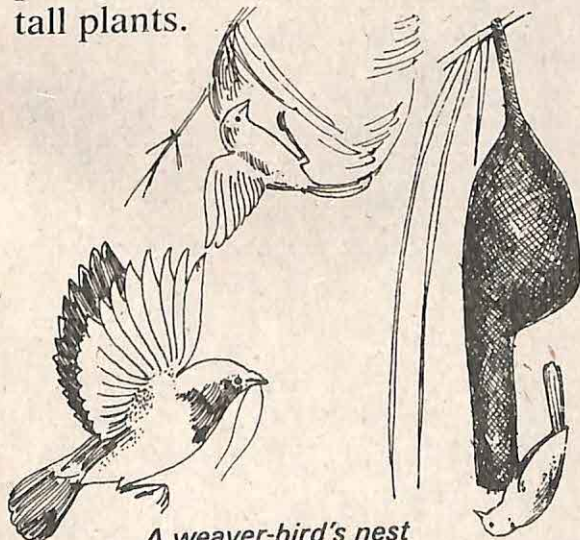


They feed their nestlings until they open their eyes and become strong enough to learn to fly. It is fun to watch parent-birds teaching their young ones to fly.



*Some birds build their nests on the ground*

Birds like fowls and partridges build shallow nests on the ground. From this we understand that their young ones can walk and run on hatching out of their eggs. They scoop out mud and spread straw and hay and lay their eggs on this ground-level nest. Usually they choose a paddy field or a grassy meadow so that their nests are hidden by tall plants.

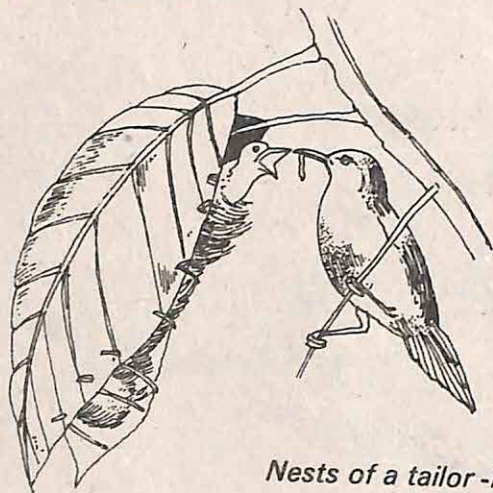


*A weaver-bird's nest*

A weaver-bird uses fine strips of banana and palm leaves to build its cradle-like nest. It builds a deep cup which acts like a cradle for the young ones. It is deep enough to prevent the baby birds from falling. This 'nursery' is reached by a long tunnel. The nest hangs like an upturned pot with a long neck, rocking gently in the breeze.



A tailor-bird chooses a broad leaf for stitching its leafy nest. Sometimes it chooses two or three leaves near one another and stitches them together. It stuffs the leaves with cotton and uses cobwebs to stitch the margins of the leaves. It uses its sharp curved beak as a needle for stitching. Because of its talent in stitching, it is named tailor-bird.



*Nests of a tailor-bird and a woodpecker*

A woodpecker drills a hole into the trunk of a tree and builds its nest there. Parrots, owls and hornbills make their nests in hollows of

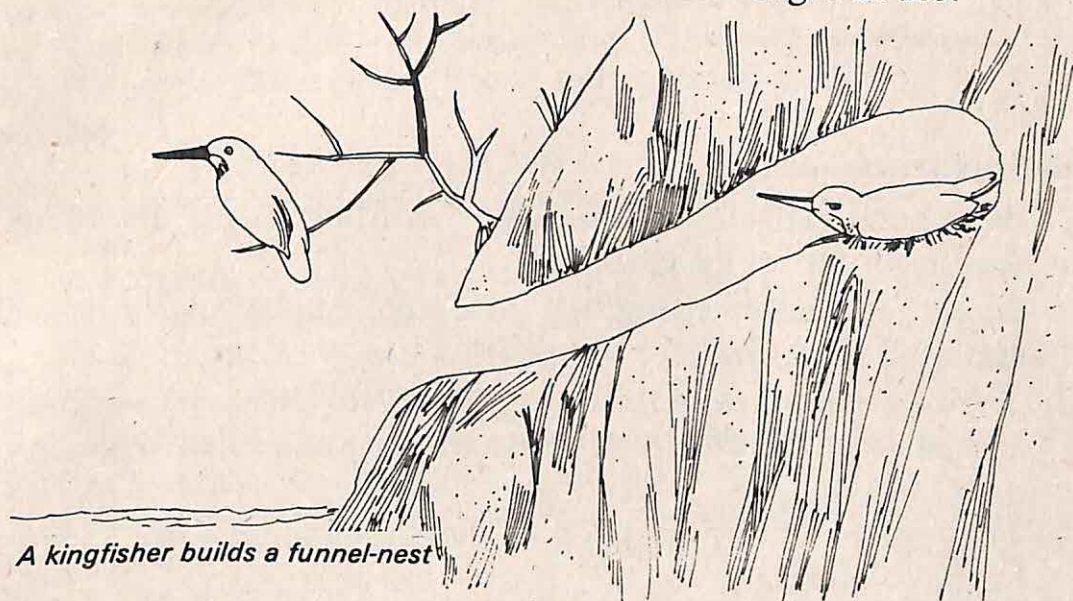


*Parrots and owls build their nests in hollows*



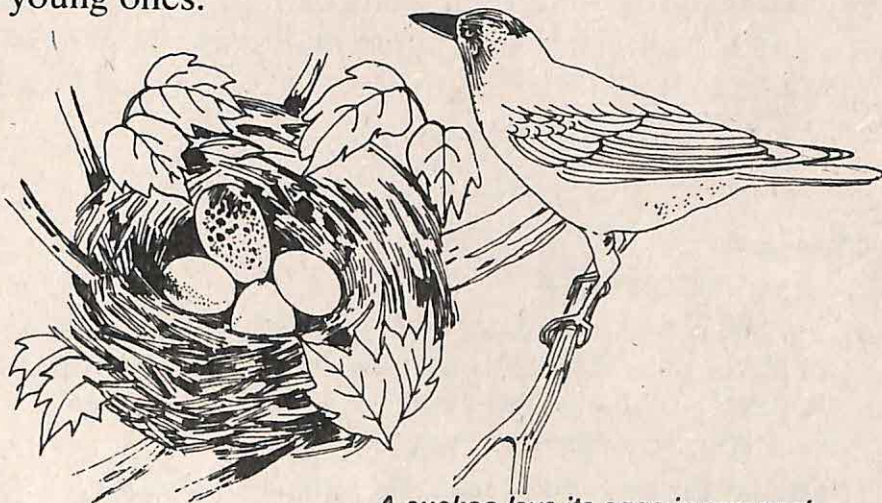


tree-trunks. You can see the parent birds going in and out of a hole carrying food for their ever-hungry babies. Sometimes you see a tree trunk with holes — these are nests which are no longer in use.



*A kingfisher builds a funnel-nest*

A kingfisher digs a long tunnel on the bank of a pond or river and scoops out a nursery deep inside it. It spreads fishbones on it to make a cosy bed for its young ones.



*A cuckoo lays its eggs in any nest*

The one exception to nest-building activities is the cuckoo. A cuckoo never builds a nest of its own. The lazy mother cuckoo lays her eggs in another bird's nest, throwing away one or two of its eggs. The unsuspecting 'foster-mother' feeds the cuckoo babies along with



her own! Only when they grow a little older, the bird notices the difference. It promptly drives away the fatter young cuckoos from its nest.

### Things to remember

1. Birds build their nests during their breeding season. Breeding seasons differ for different birds.
2. Parent birds get busy hunting for a suitable place and nest-building materials to do this.
3. They use twigs, (even thorny ones), bits of wire, strips of banana and palm leaves, cobwebs, threads, hay, etc. as nest-building materials.
4. They spread cottonwool and feathers to make a warm, cosy bed for their babies.
5. The shape of the nesting places and the nests depend upon the nature of the nestling born.
6. Just as birds build their nests carefully, they also look after their babies well. They feed them and teach them how to fly.

### Things to do

#### IN YOUR NOTEBOOK

1. Try and collect nests after birds have left them. In your notebook make a note of all the materials each bird uses for nest-building. Draw sketches of nests you have collected and label them.

#### FOR YOUR CLASSROOM DISPLAY

1. Display the nests you have collected in your classroom. Keep cardboard cutouts of parent birds and the nestlings in each nest.
2. If you happen to get a weaver-bird's nest, push your hand carefully into the cups. Feel around to see how it is built.
3. Examine a tailor-bird's nest to see how well the tiny bird has stitched the leaf-margins with its sharp, curved beak.



## Exercises

1. Write the answers to the following questions briefly:
  - a. Why does a crow build a deep, cup-shaped nest?
  - b. What material does a sparrow use for building its nest?
  - c. What sort of cradle do the nestlings of weaver-birds have?
  - d. Why does a tailor-bird have a sharp, thin, curved beak?
2. Who am I?
  - a. I lay my eggs in the crow's nest. I am a lazy bird. ....
  - b. I build a nest with a tunnel. My nursery is covered with fish-bones. ....
  - c. I build a shallow nest. I build it in a paddy field. ....
  - d. I have a horn on my beak. I live in a hole in a tree trunk. ....
  - e. I build a leafy nest. I use cobwebs to stitch my nest. ....
3. Complete the following sentences:
  - a. A tailor-bird stitches two or three leaves together if it cannot get a .....
  - b. Weaver-birds make a deep cradle because .....
  - c. Sparrows are friendly birds. So they build their nest .....
  - d. Parent birds carry cottonwool and tiny feather to .....



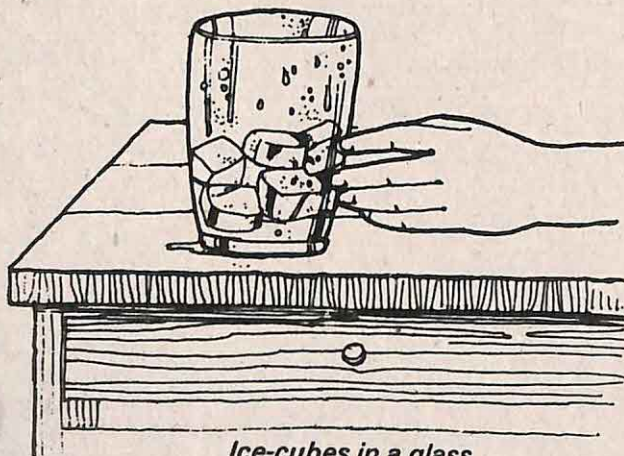
## UNIT IV AIR, WATER AND WEATHER

### 9. The changing weather

You know that water evaporates from the surface of lakes, rivers and oceans and goes into the air as water vapour. This air contains a lot of water in the form of water vapour.

#### **Water exists in three forms**

You know that water is a liquid. It can be made to flow from a higher level to a lower level. This is true of all liquids. We can see and feel the presence of water. On the other hand, we cannot see water vapour, but we can feel its presence in the air. We can change water vapour into water by cooling.



**Experiment 1:** If you keep some ice cubes in a glass tumbler and leave it for some time, you will find tiny droplets of water collecting on the outside of the tumbler. This happens because water vapour from the air changes to water on cooling. We cannot see water vapour. It is a gas. The change of water vapour into water is called condensation.

Change of gas into liquid on cooling is called condensation.





*Add salt to the ice*

### Experiment 2:

If you add some salt to the ice cubes kept in the tumbler, there is more cooling effect. The mixture of ice and salt is called freezing mixture.

Due to excessive cooling, water vapour found in the air not only condenses into water on the outer side of the tumbler, but it also becomes ice. This change of water to ice is called freezing. Ice is a solid.

Change of liquid to solid on cooling is called freezing.



*Heat the water*

**Experiment 3:** Scrape off the ice formed on the outside of the tumbler and put it in a bowl. Heat this gently. Ice first melts into water.

Change of ice into water is called melting.

Change of solid to liquid on heating is also called melting.

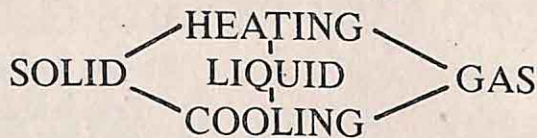
Continue heating this water. It slowly evaporates to form water vapour. When water boils, water vapour escapes out of it rapidly and disappears in the air, being a gas.

Change of liquid to gas on heating is called evaporation.

Thus water exists in three forms, solid (ice), liquid (water), and gas (water vapour).



These three forms of water are inter-changeable.



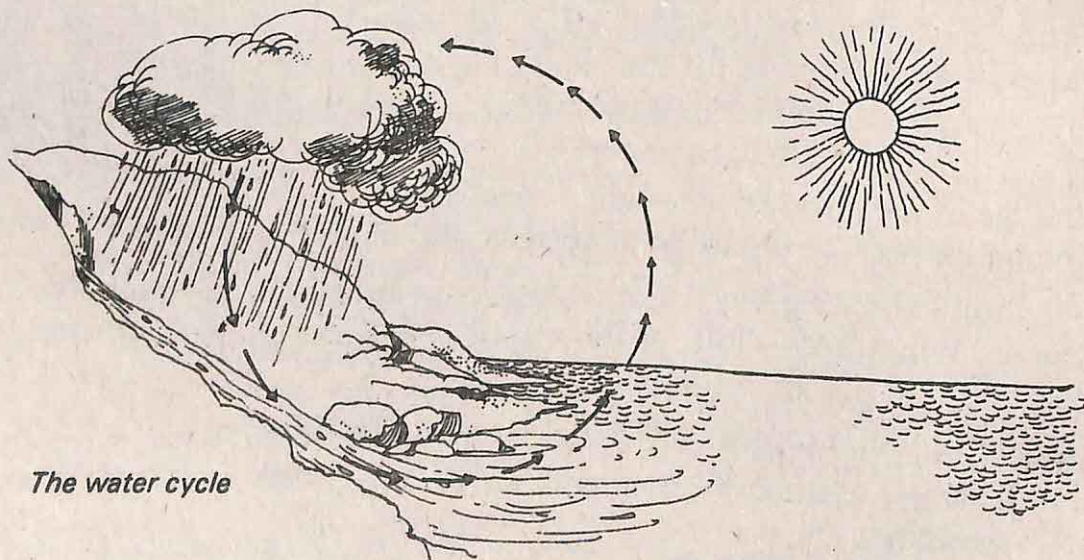
Thus we find that water is constantly undergoing change.

### **Water cycle**

In summer, the heat of the sun causes a lot of water to evaporate from lakes, rivers and seas. Because of the heat, evaporation takes place very fast. As a result of this evaporation, the air is filled with water vapour.

Warm air rises and gets cooler and cooler as it goes higher. When you climb a mountain, you can feel the air getting cooler, the higher you go. Air contains lots of dust particles. When water vapour condenses in the cool air, tiny droplets of water are formed and these cling to the dust particles. This is how clouds are formed. When cool wind blows, there is further condensation. Tiny droplets of water in the cloud join, become larger and heavier and fall as rain.

When rainwater reaches the ground, it sinks into the soil. This groundwater is used for irrigation. When rain falls over mountains, it forms waterfalls and streams. These mountain streams join to form a river. The river flows through the plains and finally joins the sea.

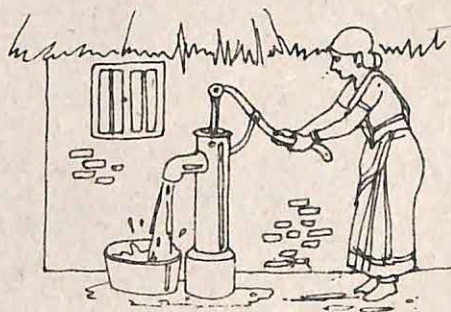
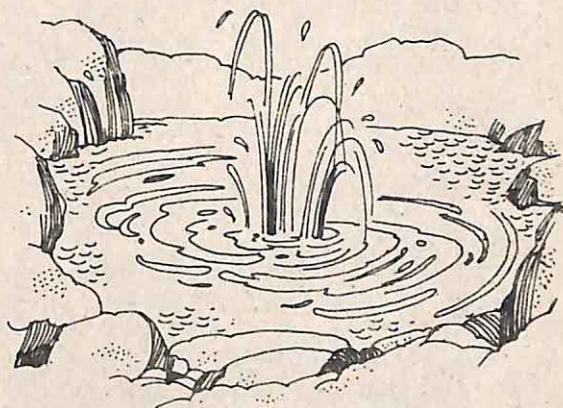
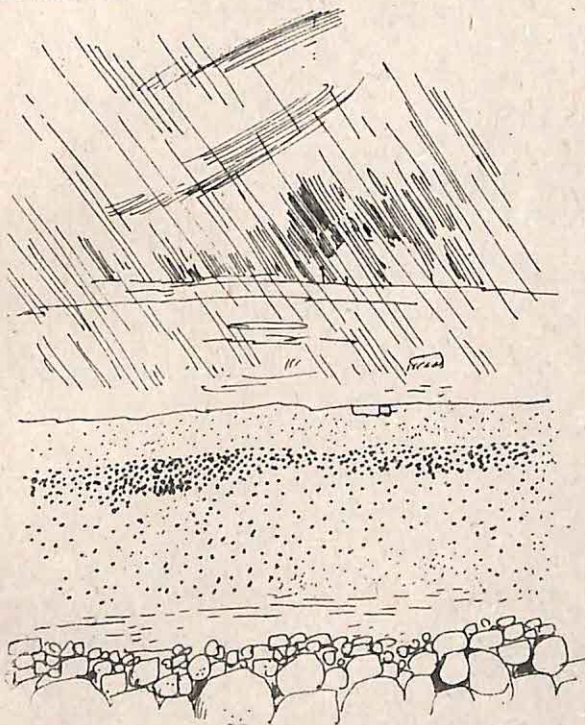




Once again, water has to evaporate from the sea and the water vapour has to travel a long way before it becomes rain and reaches the sea back through the river. This is called the water cycle. The water cycle repeats itself year after year. It is one of the most important happenings in nature.

### **Where does rain water go?**

Rain water that sinks into the soil forms a water table above the level of rocks. This is how natural springs form. When a borewell is dug, this water comes out with force to the surface like a fountain. So, in an indirect way the irrigation water comes from rain.



*Rainwater reaches ground level and becomes a spring*

### **How are lightning and thunder caused?**

Close to the ground air is warm, but it gets cooler and cooler the higher you go. So the top of a mountain is colder than the plains.

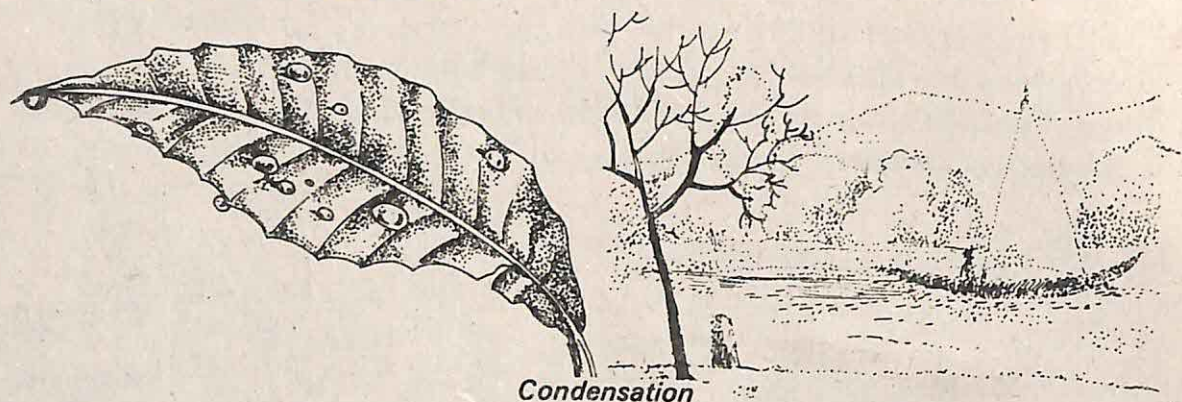
On a warm day in summer, a layer of warm air collects over the hot ground. Above this is a layer of cool, heavier air. As the sun continues to shine during the day, the layer of warm air gets thicker and takes up more moisture from the sea. When the mass of warm air rises up,



breaking through the layer of cool air, the water vapour in the air condenses to form dark clouds. When these clouds rise up rapidly electric currents are formed and they produce lightning and thunder.

### **Other forms of condensation**

Water vapour which condenses on objects on the ground like leaves and spider webs is called dew.



*Condensation*

Fog is a cloud near the ground. It contains many small drops of water. It is very hard to see things around you when there is a fog.

Sometimes raindrops fall through very cool air and freeze. Frozen rain comes down as sleet. Sleet is frozen raindrops.



*Sleet is frozen rain*

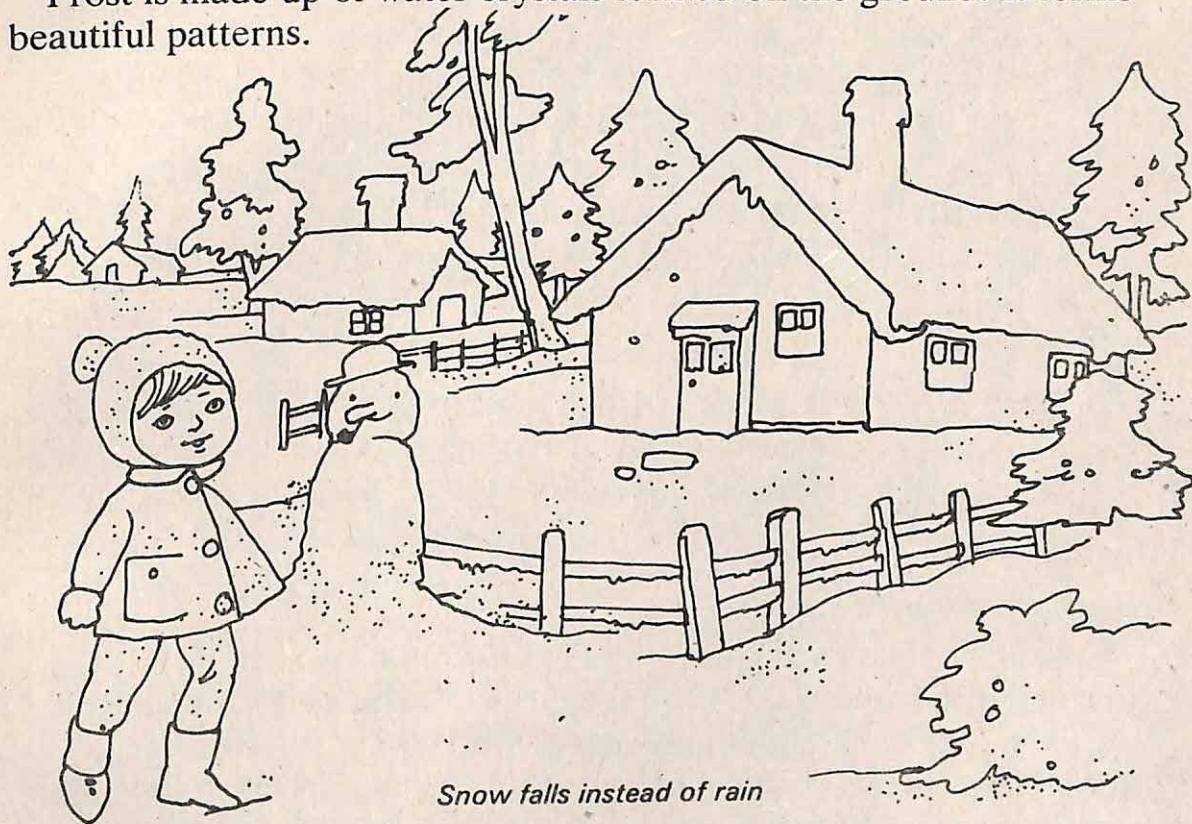
When strong winds blow and carry the sleet back into the clouds, more water condenses on it. Every time it is blown back more and more water condenses on sleet. This heavily condensed sleet is called hail. Hailstones are really heavy pieces of ice. Sometimes we



get hailstorms instead of summer showers. Hailstones make a banging noise on roofs or bounce off umbrellas. Large hailstones can be dangerous. They can kill small animals or damage crops.

In cold countries, there is snowfall instead of rainfall. When the air is very cool, water vapour condenses into beautiful snow flakes. They are tiny crystals of ice.

Frost is made up of water crystals formed on the ground. It forms beautiful patterns.



*Snow falls instead of rain*

## **Changes in weather**

The weather of a place is determined by different things. These are the sun, moisture in the air, clouds, rain. Two other factors are also the height of the place and distance from the sea.

The weather can change from hour to hour, day to day and from season to season in a year. The weather is very cool early in the morning and gets warmer as the heat of the sun rises. Again after sunset the weather gets cooler and cooler. In the space of a week, there could be a few warm days, a few hot days and a few cold days.



The weather also changes from month to month. In India, April, May and June are very hot months while December to February the weather is cold. In some places, like North India, it can be very cold, while in South India it is not so cold. Hot or cold weather over a period of time is called climate.



### **Pleasant climate**

A pleasant climate makes us feel comfortable. We can do a lot of work and also travel a lot. Playing games or arranging excursions is very easy. Travelling on a rainy day or when there is a fog is very difficult and risky. Driving a car or an aeroplane through a fog is very dangerous. It could cause accidents as we cannot see what is happening around us. Sudden changes in weather spoil our health.

### **Things to remember**

1. Water exists in three forms. These are solid, liquid and gas — ice, water and water vapour.
2. Condensation takes two forms. One is the change of gas to liquid.



The other is the change of water vapour to liquid.

3. The change of liquids to solids on cooling is called freezing. The change of water to ice is through freezing.
4. The change of solids to liquids on heating is called melting. The change of ice to water is through melting.
5. The change of liquids to gas on heating is called evaporation. The change of water to water vapour is through evaporation.
6. One of the most important happenings in nature is the water cycle. This is the evaporation of water from the sea, formation of clouds, rain falling, streams and rivers going to the sea and again evaporating from the sea.
7. Water vapour condenses on dust particles and forms clouds.
8. The sudden rise of warm air filled with water vapour into the layer of cool air causes formation of clouds. These clouds rise rapidly and produce lightning and thunder.
9. Rain water seeps into the soil and forms the watertable. This water is pumped for irrigation from wells and springs.
10. Water vapour condenses on the ground and forms dew drops.
11. Fog is a cloud near ground-level.
12. Sleet is frozen raindrops.
13. When sleet is blown repeatedly into clouds, hail is formed.
14. Hail is harmful to plants and animals.
15. In very cold countries because of the cold there is snowfall instead of rainfall.
16. Weather can change from hour to hour, day to day, month to month. It does change from season to season and year to year. This is called the climate of a place.
17. It is pleasant to live in a place with a good climate.
18. Sudden changes in the weather could be bad for health.



## Things to do

### FOR YOUR CLASS DISPLAY BOARD

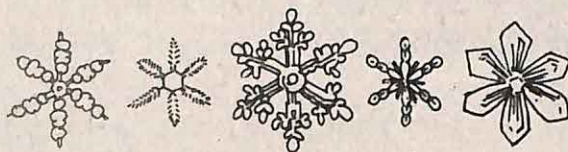
1. Note the time taken by a spoonful of water to evaporate when placed in the following containers under the following conditions:
  - a. in a bottle with a narrow neck, placed under the sun,
  - b. in a saucer placed in the sun,
  - c. in a saucer placed in the shade,
  - d. in a saucer placed in the sun and fanned with a hand fan,
  - e. in a saucer placed in a tightly closed vessel.

Note down your observations like this. Display it on the class display board.

Experiment number	container	condition	time taken for water to evaporate	conclusion

### IN YOUR SCIENCE NOTEBOOK

1. Imagine a rainy day and draw it in a drawing sheet.
2. Draw a street scene when there is a fog.
3. Collect pictures of snowflakes. Note how the crystals have different shapes. No two crystals look alike.



## Exercises

1. a. What are the three forms of water?
  - b. What is a sleet?
  - c. What is a fog? Why is it harmful?
  - d. How are lightning and thunder caused?



2. Fill in the blanks choosing correct words from the box given below:

evaporation	snowfall
condenses	hail
	condensation

- The change of water vapour into water is called .....
  - The change of liquid to gas on heating is called .....
  - When sleet is blown repeatedly into clouds, ..... is formed.
  - There is ..... instead of rainfall in cold countries.
  - Water vapour ..... on dust particles to form clouds.
3. Group the following according to their kind. Draw columns as shown. The first box contains the words you need.

	snowflakes	ice sleet	fog
water		frost	hailstorm
	rainfall	cloud	hail
snowfall		water vapour	

frozen water drops

- .....
- .....
- .....

three forms of water

- .....
- .....
- .....
- .....

water vapour and dust particles

- .....
- .....

types of rain

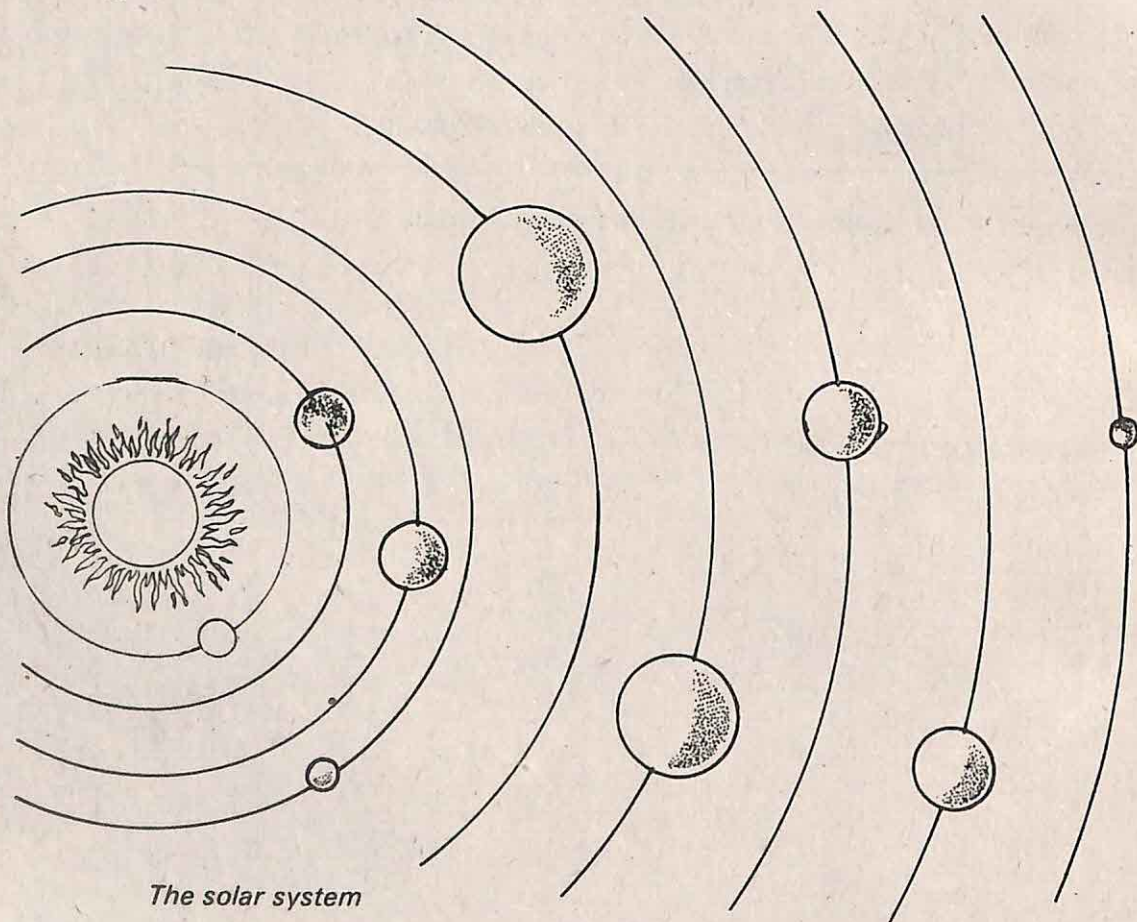
- .....
- .....
- .....



## 10. The earth and the sky

### Our universe

The sun and its family of circling bodies make up the solar system. The sun is the largest body in the solar system. The solar system forms part of our universe.

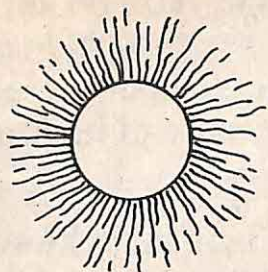


*The solar system*

### How big is our universe?

We see millions of stars in the sky on a clear night. But with the help of telescope we can see many more stars than what we see with our naked eye. Scientists use telescopes to observe heavenly bodies.





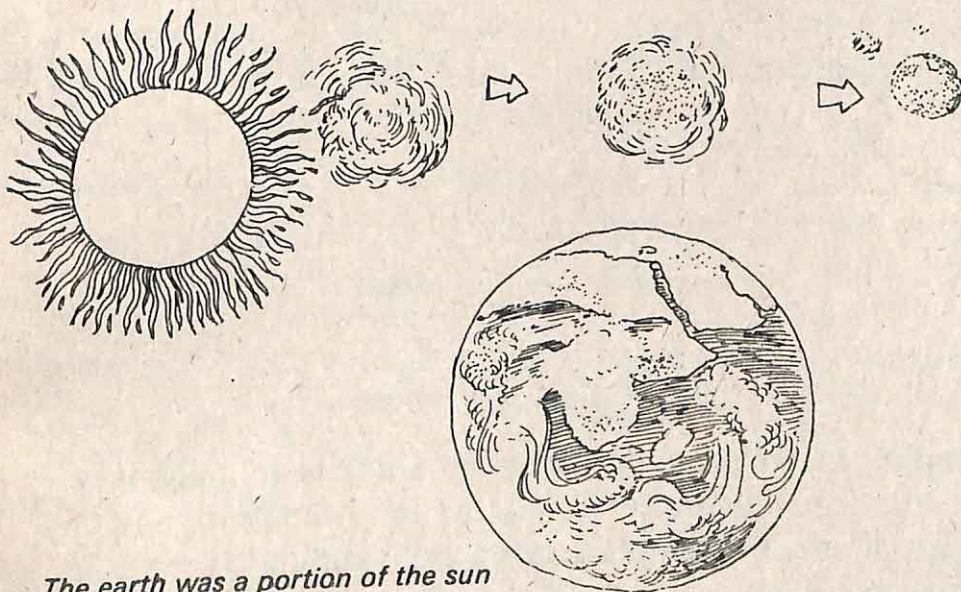
*The sun*

The sun is a star. There are stars bigger than the sun. The earth is very small compared to the sun. If you can understand that the solar system, which is itself so large, is only a small part of the universe, you can imagine how vast our universe is.

## **How was the earth formed?**

Long long ago, there was no earth at all. Scientists believe that a portion of the sun got separated and the earth was formed. All the other planets must have been formed in the same way.

Since it is part of the sun, the earth must have started as a large ball of burning gases. This spun around for many millions of years and got cooler through these years. When the earth cooled enough, it became hard. Water vapour found among the hot gases cooled down to form water. The water filled parts of the earth to form oceans. Due to the uneven cooling of the earth mass, mountains, plateaus and valleys were formed.



*The earth was a portion of the sun*



## **The earth is round**

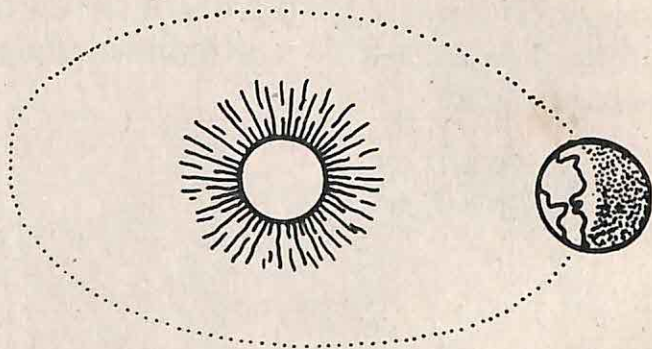
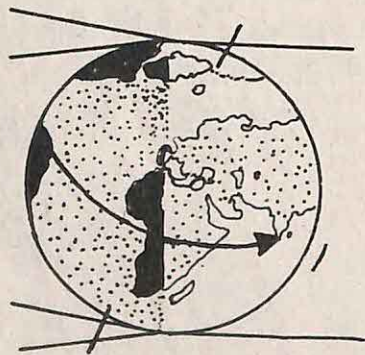
When we start travelling from one place on the earth on an aeroplane or a ship and travel in what we think is a straight line, we are sure to come back to the place where we started our journey. This shows that the earth is round. It appears flat because of its size.

## **Why do the sun and moon appear so small?**

The sun is a very huge ball of fire. It is 93 million miles away from the earth. It looks small because of its distance from the earth. The moon is smaller than the earth. But it is only 2,40,000 miles away from the earth. So it looks as big as the sun. Thus the sun and the moon appear so small because they are very far away from us.

## **How we know the earth turns**

The sun appears to move from east to west across the sky. But it is the earth which actually spins round from west to east.



*The earth spins from west to east*

## **Rotation**

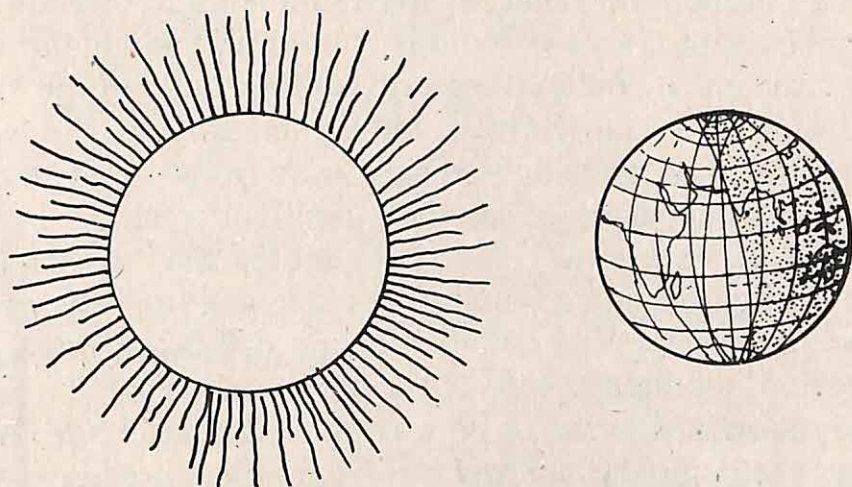
The spinning of the earth on its own axis, which is an imaginary line, is called rotation. The earth completes one rotation in one day or 24 hours. The line connecting the north pole and the south pole forms this axis.



## What causes day and night?

As the earth spins, one half of it directly faces the sun and receives light and heat directly from it. The other half remains in darkness except for the starlight and sunlight reflected by the moon as moonlight.

The period during which sunlight is received directly is called **day**, and the period of darkness is night.



*Day and night*

Night and day follow each other in succession as the earth rotates on its axis once every 24 hours. For example, when the people of India have day, the people of America have night and when we have night in India, the Americans have day.

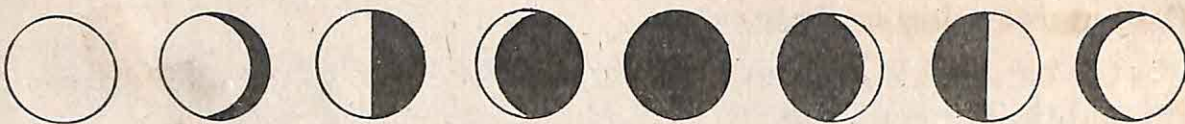
## How do we get moonlight?

The earth and the moon do not have light of their own. They reflect light received from the sun. Thus we get moonlight during the night when our part of the earth does not receive sunlight. If we were to go to the moon, we would be able to see the earth shining brightly just as we see the moon from the earth. The earth also reflects the light it receives from the sun.

## Phases of the moon

The moon makes one complete trip around the earth in about 29 days. It also rotates on its axis once during this period. Therefore,



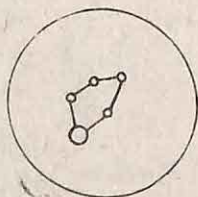


*Phases of the moon*

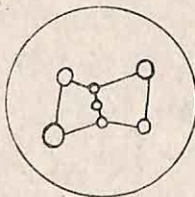
the same side of the moon is always turned towards the earth. Only the astronauts who landed on the moon have seen the other side of the moon!

It is this side of the moon that receives sunlight and reflects it back to the earth. We cannot always see this lighted part as the moon travels round the earth. When the moon is on the side of the earth away from the sun, we can see its whole lighted portion, the full moon. As the moon turns its lighted side away from the earth during its journey round the earth, we see the moonlight waning, or reducing, day by day. When we see only half of the lighted side, we call it the first quarter. As the lighted side completely turns away from the earth in a fortnight, we get no moonlight at all. This we call the new moon. After this period, the lighted side of the moon once again begins to appear. The moonlight seems to be waxing or increasing day by day until it shows the complete, lighted side in another fifteen days.

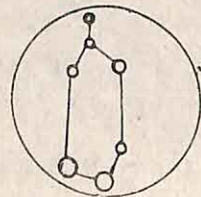
The different appearances of the side of the moon are known as phases of the moon.



*Taurus*



*Orion*



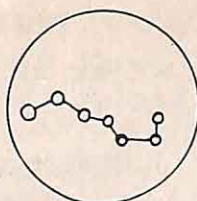
*Gemini*

### **Constellations or star patterns**

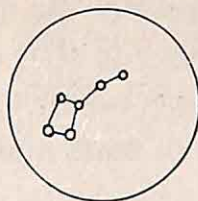
Stars are divided into groups called constellations. The arrangement of stars within the constellations have suggested the forms of animals, people and gods. Here are the names of some of the constellations:

- |               |                       |
|---------------|-----------------------|
| 1. Taurus     | the bull              |
| 2. Orion      | the hunter            |
| 3. Cassiopeia | the lady in the chair |

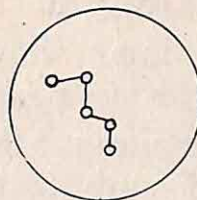




*Ursa Major*



*Ursa Minor*



*Cassiopeia*

4. Ursa Major

or

The Big Dipper  
(Saptarishi)

Great Bear

5. Gemini

the Twins

6. Ursa Minor

or

The Little Dipper

the Little Bear

The Pole Star that points towards north forms part of the Little Dipper.

### Things to remember

1. The sun and its family of circling objects make up the solar system.
2. The sun is the largest body in the solar system.
3. Millions of stars can be seen on a clear night in the sky.
4. Scientists use **telescopes** to **observe** the heavenly bodies.
5. Scientists believe that the earth was formed when it broke away from the sun. The other planets were also formed in a similar manner.
6. The earth started as a large ball of burning gases. It cooled and became a solid mass.
7. The earth is round.
8. The sun and the moon appear small because of their distance from the earth.
9. The earth spins round its axis once in 24 hours. This is called rotation.
10. The rotation of the earth round its axis causes day and night.



11. The earth and the moon reflect the light they receive from the sun.
12. The moon shows the same side to the earth. So, we see the phases of the moon, and not full moon always.
13. The patterns that groups of stars make have definite shapes, which give them names.
14. These star patterns are called constellations.

### Things to do

1. Watch the sky every night to study the phases of the moon and the star patterns. Learn to identify them from the figures given in the textbook.



2. If you are able to watch star patterns in the night, you will see stars shift their positions. Like the sun and the moon, stars rise and set every day.
3. If you happen to go to a hill-top or open countryside on a bright, starry night, try to look at the entire sky (horizon) which looks like a huge upturned bowl studded with bright stars.

### Exercises

1. Answer the following briefly:
  - a. What is rotation of the earth?



- b. What are constellations?
- c. How are day and night caused?
- d. How do you know that the earth is round?
- e. Why do the sun, the moon and the stars appear to move from east to west in the sky?

2. Match the following:

- |               |                       |
|---------------|-----------------------|
| a. Taurus     | The Hunter            |
| b. Ursa Major | The Twins             |
| c. Gemini     | The lady in the chair |
| d. Orion      | Saptarishi            |
| e. Cassopia   | The Bull              |

3. Find me out by filling in the missing letters:

- a. ...ELESC...P...
- b. ...NI...ERSE
- c. RO...A...ION
- d. R...FLEC...
- e. OR...ON

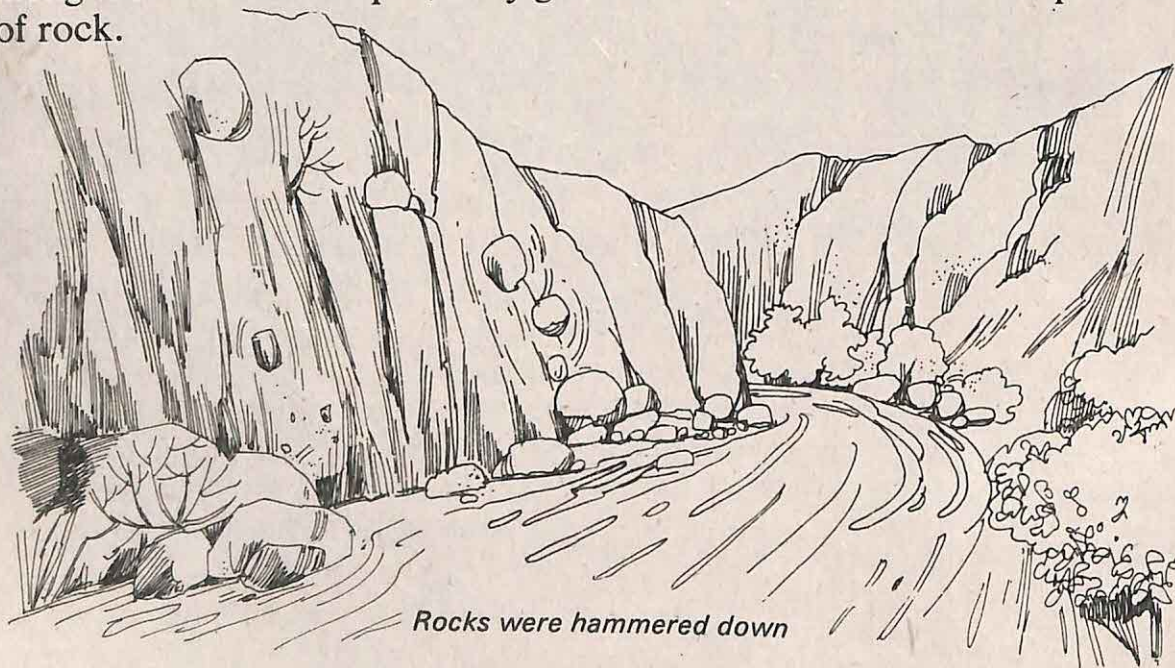


# 11. Soil and plant life

The earth surface is covered with soil except in places where there are naked rocks and sheets of water on the surface. You know that water and air are absolutely necessary for life. You are now going to learn how important the soil is to us.

### Birth of soil

Rocks found in mountains have been hammered by agents like wind, water, the heat of the sun, burrowing animals and roots of plants through ages. Rocks get chipped off and turn into pebbles and sand. Huge rocks get broken into boulders. As these boulders roll along the mountain slopes, they get further broken into smaller pieces of rock.



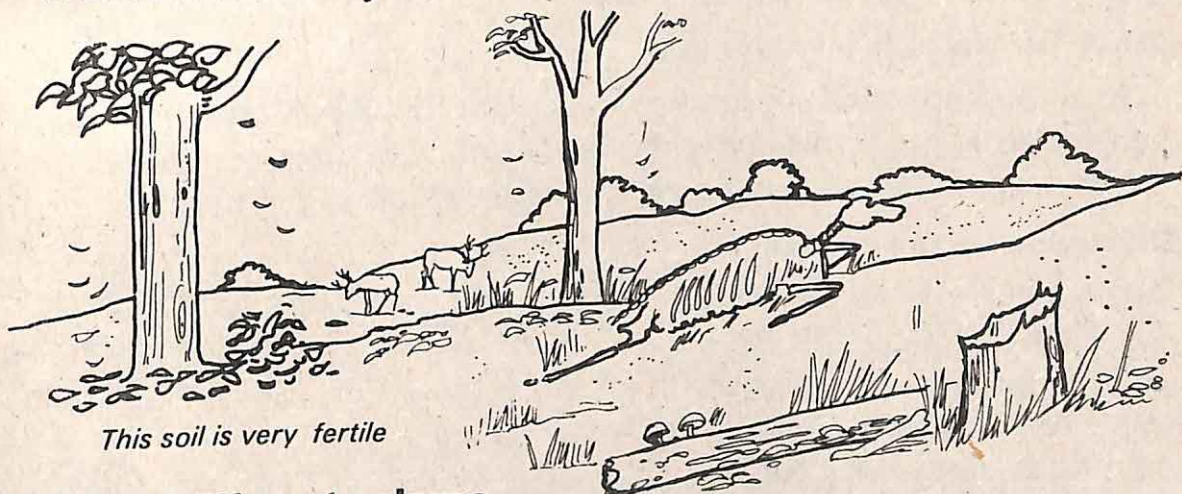
### Soil and plant

The smaller particles of rocks contain minerals which are food for plants. But they are only part of the soil. In this rock-soil, small plants like moss and lichen begin to grow. When they die, they get mixed



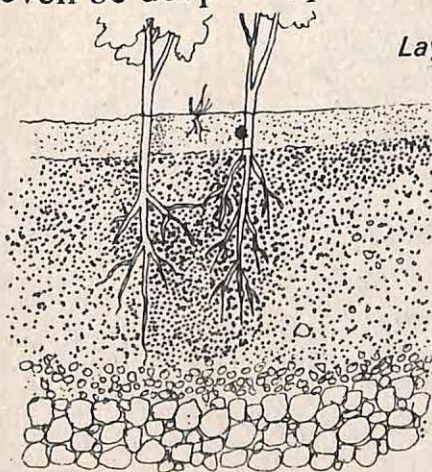
with the soil and form a part of it. Later on this mixed soil is the soil on which bigger plants grow. When these plants die they also get mixed with the soil and make it even richer in minerals. Sometimes dead animals get decayed and form part of the soil. The soil gets darker in colour when it gets richer with the remains of dead plants and animals. This soil is best for growing healthy plants, because it is most fertile.

It takes millions of years for rocks to turn into soil particles.



### **Soil is of different colours**

As you travel long distances by train or car, you see rocks of different kinds, shapes, sizes and colours. When they turn into soil particles they give varied colours to the soil. That is why soil in some regions is black or deep brown and in other places, it is red. It can even be deep red, pale yellow or pure white in places.



*Layers of soil*

### **Layers of soil**

Soil is made of layers of different colours. Soil is dug deep for laying roads and for laying the foundations. For house-building, we see layers of soils of different colours. The topsoil is darker in colour due to



the presence of dead and decaying plants and animals. This is called humus. The topsoil contains lots of humus. This layer of soil has plants growing on it. Plant roots spread well and get fixed in it.

Below the topsoil, there is a layer of subsoil, lighter in colour. The soil particles are much bigger in this layer than in the topsoil. It is not suitable for the growth of plants.

Further down, the soil particles are still bigger and it mostly contains stones and rocks. This is called the rock bed.

### **Other forms of life in the soil**

Now you know that topsoil supports plant life. Apart from plants, many other living forms are found in the soil. They are very small bacteria, germs, insects and bigger animals which live in burrows.

### **Different forms of soil**

**Experiment:** Take a handful of garden soil and put it in a wide-mouthed bottle. Add water to it. You will find air bubbles coming out. Air is found between the particles of soil. This helps the plant roots to breathe.



Stir the soil and water very vigorously with a stick and allow it to settle for a few hours. You find different coloured soils settling in different layers. The largest and heaviest particles go to the bottom. They are stones and pebbles. Above this layer, bigger grains of sand settle. Over this layer we find a layer of fine sand, above this, we find clay particles. Humus floats on top of water.

Let us see what colour these layers are stones and pebbles are dark. Some pebbles may be lighter. The big grains of sand are darker than the fine sand. Clay is deep brown or black. Humus is also reddish black.

Thus we know that soil contains humus, clay, sand, stones and pebbles, some of which dissolve in water. The soil rich in humus is called loam.



## How water seeps through sand, clay and loam

Clay is made up of very fine grains or particles. These particles are very close to each other. So there is not much air between the particles. Clay particles absorb water and swell. So these particles get closer than before. So clay does not permit water to seep through it quickly.



*Different kinds of soil*

Sand is made up of fine grains, bigger than those of clay. So particles of sand hold a lot of air between them. Water is able to seep through sandy soil very quickly due to the spaces between sand particles.

The best kind of soil is loam. Loam contains the right proportion of sand, clay and humus. The sand in it holds air between its particles. The clay absorbs water. Humus not only absorbs water, but also has enough minerals and keeps the soil loose. Therefore, water passes through loam slowly. This helps the plant roots to get enough water, air and minerals.



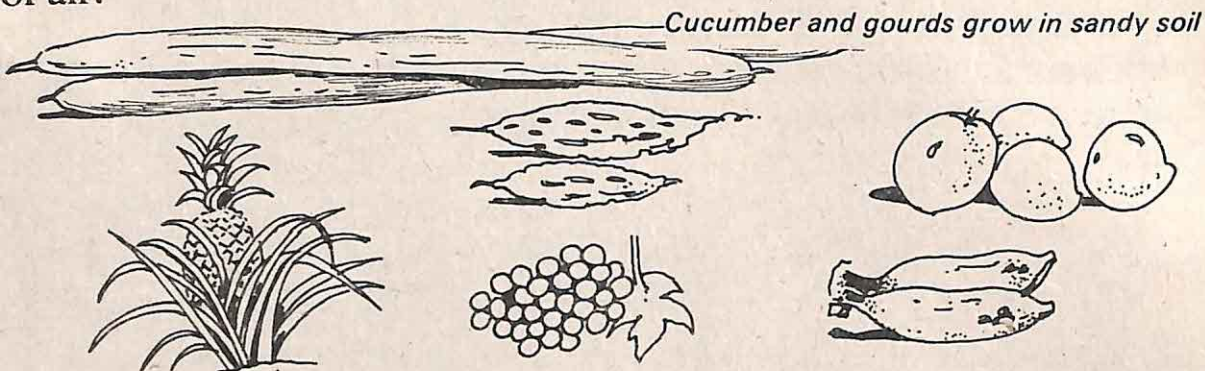
*Paddy grows in clayey soil*

## Different plants grow in different kinds of soil

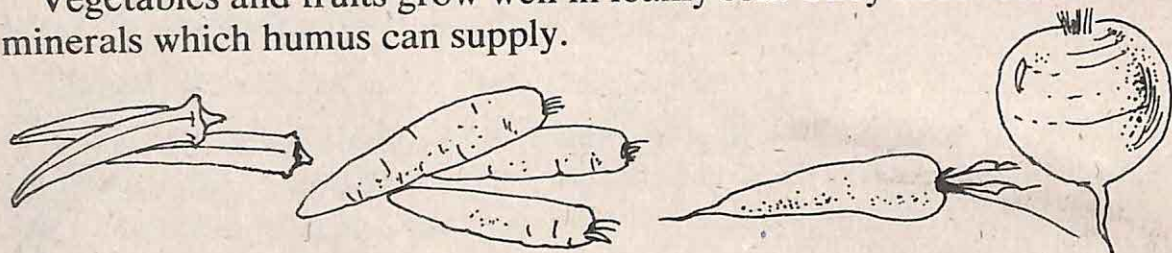
Paddy grows well in clayey soil. Its roots need to be in water and clayey soils retain water.



Cucumber and gourds grow well in sandy soil. Their roots need lots of air.



Vegetables and fruits grow well in loamy soil. They need lots of minerals which humus can supply.



*Vegetables and fruits grow in loamy soil*

5. Sand, clay, humus and stones or pebbles are various forms of soil.

Cherry 1/2

### Things to remember

1. Rocks break into pieces to form soil particles.
2. It takes millions of years for rocks to turn into soil particles.
3. Wind, water, the heat of the sun, burrowing animals and roots of plants help to form soil particles.
4. Rocks are of different colours. So the soil formed from these rocks are of different colours.
5. Topsoil supports plant life. It supplies lots of minerals for the growth of plants.
6. Soil helps plants because it enables the plants to fix their roots in it.
7. Sand, clay, humus and stones or pebbles are various forms of soil.
8. Loam is a type of soil which contains proper proportion of sand, clay and humus. This suits plant life best.



9. Clay retains a lot of water as it is made of very fine particles.
10. As sand particles have a lot of air space between them, water drains off a sandy soil very fast.
11. Loam is fairly loose. So water drains off well. It can hold a lot of water and air. It also contains lots of minerals.
12. Paddy grows well in clayey soil. Cucumber and gourds grow well in sandy soil. Most vegetables and fruits grow well in loamy soil.

### Things to do

1. Experiment to test the quality of soil to drain water.

Take three tins and at the bottom of each make small holes. Put sand in one tin, clay in the second and loam in the third bottle in equal amounts. Pour a glass of water in each of them at the same time.

Note the time taken for water to drain off fully in each of them. Observe and record your findings as follows:

Type of soil	Time taken for water to pass through it	Remarks
1. sand	..... seconds	very fast, a good amount of water collects.
2. clay	..... seconds	very slow, very little water collects.
3. loam	..... seconds	faster than clay, a reasonable amount of water collects.

### FOR YOUR CLASS DISPLAY BOARD

1. Collect samples of soil from different places. Put them in small plastic bags. Stitch them fast on to a cardboard. Note the place of collection under each of them and pin the cardboard on the display board.
2. Germinate mustard seeds in three small bowls each containing sand, clay and loam. Note the rate of growth in each of them after a week.
  - a. At the beginning of the experiment
  - b. After one week



## Exercises

1. Answer briefly:

- a. Name the different kinds of soil.
- b. Which soil is best for the growth of plants? Why?
- c. Name the agents which hammer rocks to form soil particles.
- d. Draw the different layers of soil and name each layer.

2. Match the following:

- |                |  |
|----------------|--|
| a. loam        | drains off water very quickly                        |
| b. pebbles     | supports plant life                                  |
| c. topsoil     | contains proper proportions of sand, clay and humus. |
| d. clayey soil | heavy part of soil                                   |
| e. sandy soil  | absorbs and retains water.                           |

3. Mark T (true) or F (false):

- a. Paddy grows well in sandy soil. ( )
- b. Vegetables and fruit grow well in loam. ( )
- c. Air occupies the space between particles of soil. ( )
- d. Topsoil supports plant life. ( )
- e. Subsoil contains lots of minerals. ( )



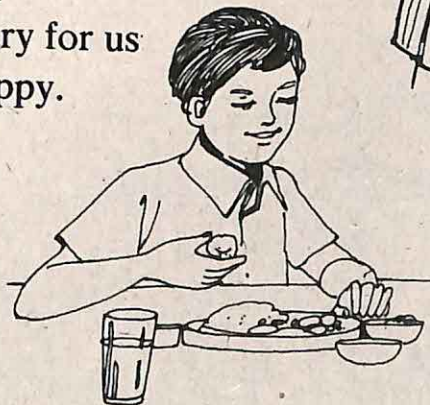
## 12. Healthy living

### Our daily routine

Although human beings are fond of variety and change, they have to do certain things everyday for healthy, happy living. Here is a list of what most of us do everyday.

1. Brushing our teeth first thing in the morning and last thing at night.
2. Bathing at least once.
3. Eating clean and healthy food.
4. Doing physical exercises.
5. Learning new things — reading books, learning an art, learning to love nature by observation.
6. Resting and sleeping.

All these are necessary for us to be healthy and happy.



*Some healthy habits*



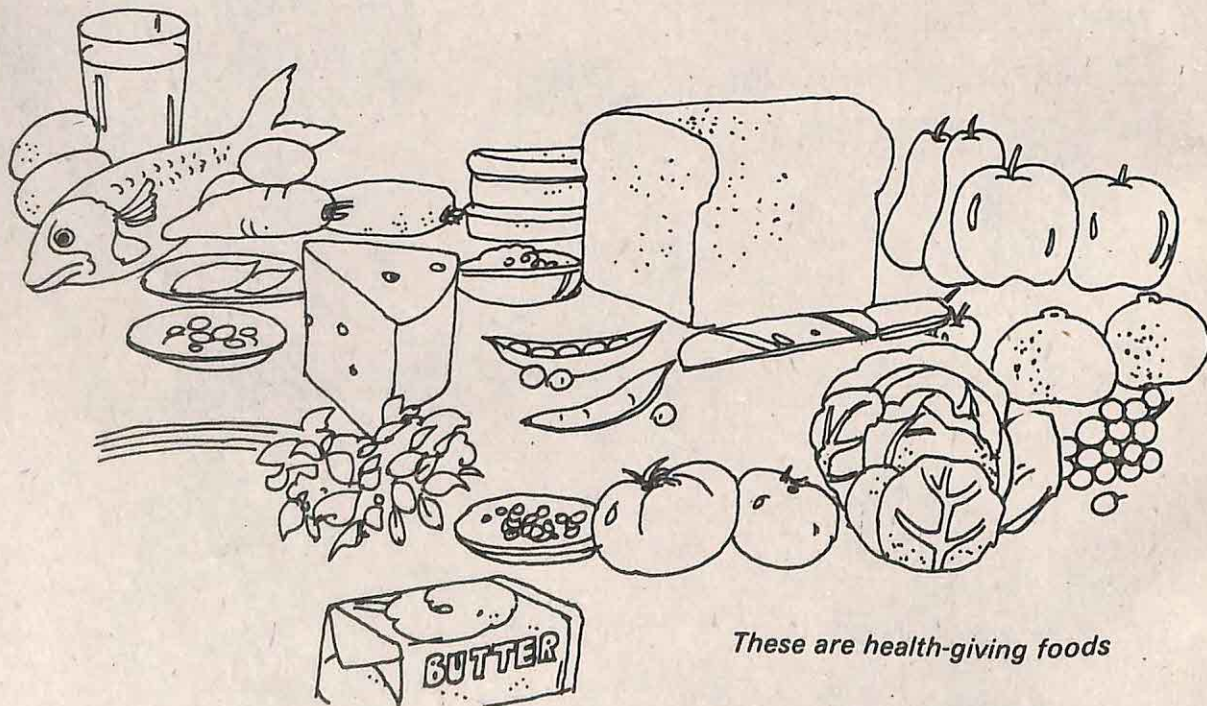


*We need exercise and rest*

## **Types of food**

All food falls into three types. They are :

- |                        |                          |
|------------------------|--------------------------|
| 1. Body-building foods | — proteins               |
| 2. Energy-giving foods | — carbohydrates and fats |
| 3. Protecting foods    | — minerals and vitamins  |

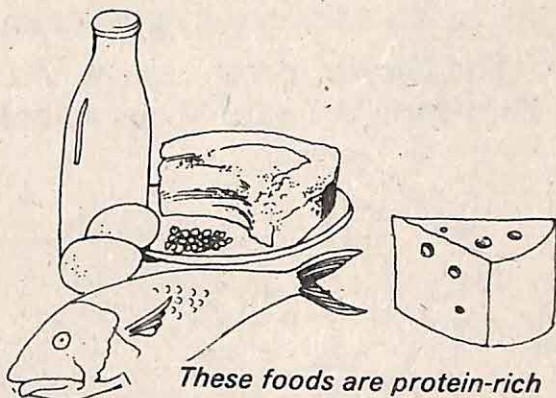
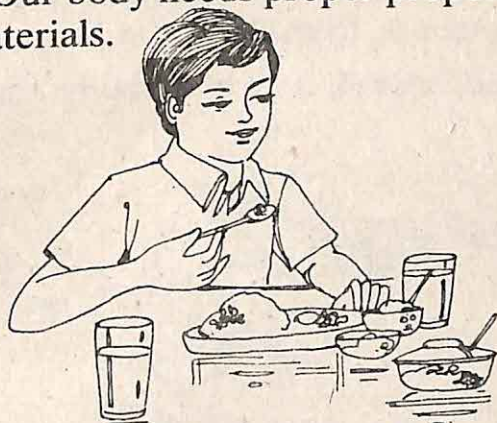


*These are health-giving foods*



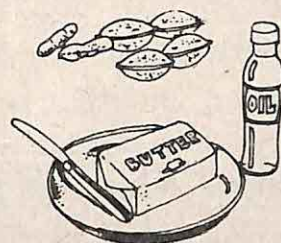
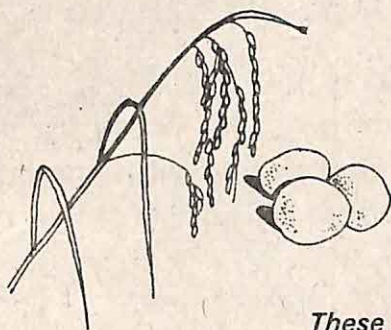
## Choice of food

Our body needs proper proportions of all the three kinds of food materials.



*These foods are protein-rich*

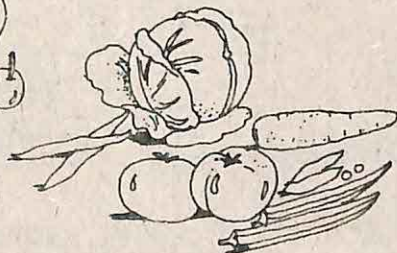
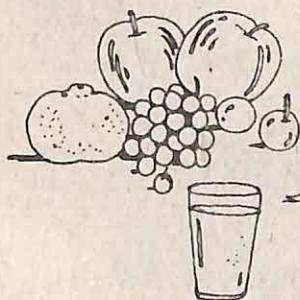
We need proteins to build up our bodies and to repair worn-out parts.



*These are energy-giving foods*

We need carbohydrates and fats to give us heat-energy for doing work.

*These foods are rich in minerals and vitamins*

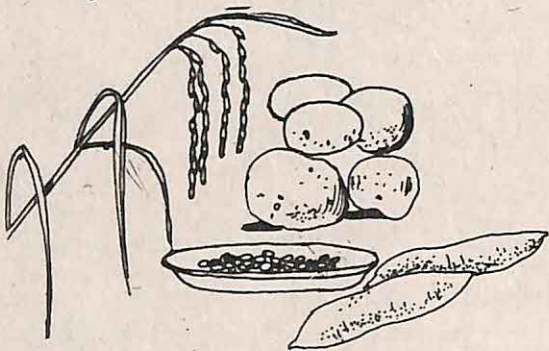


We need minerals and vitamins to grow healthy bones, teeth, hair, skin and for our general well-being.

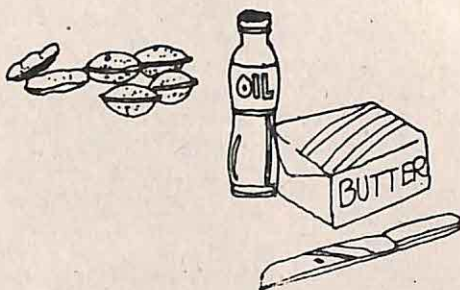


So we must choose and prepare our food in such a way that all the minerals and body-building substances in it are preserved. This will help us to have energy growth and protect us from disease.

Food-grains, potato, sweet potato, etc. contain a lot of carbohydrates. They form the bulk of our daily food.

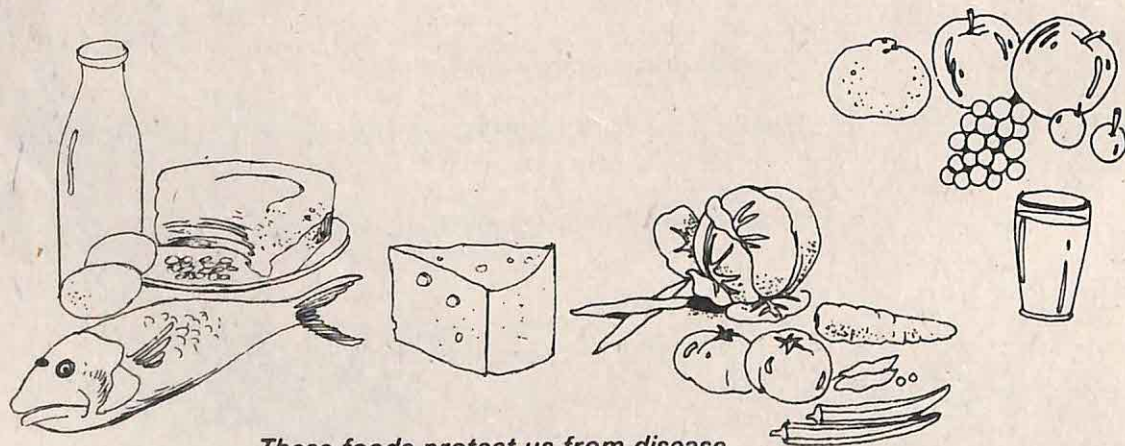


*These foods contain carbohydrates*



*These foods contain fats*

We use nuts, vegetable oils and ghee in our cooking. These contain fats. Butter, cheese, eggs and pulses contain proteins. Fresh fruit and vegetables and milk provide the various minerals and vitamins our bodies need. They also protect us from disease and infection.

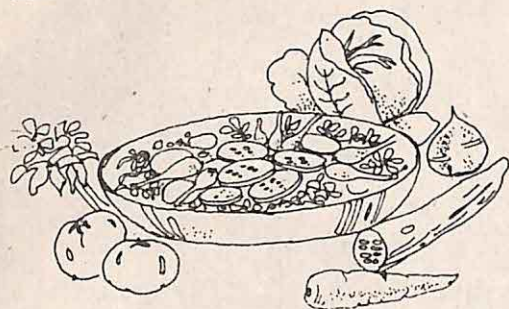


*These foods protect us from disease*

Fresh fruits and vegetables like tomato, carrot, cucumber, onion should be eaten raw so that we can get vitamins. If they are cooked, these vitamins are lost in the process of heating and boiling. However, in general, food must be cooked properly to kill germs and to soften



it for easy digestion. Some kinds of foods, such as salads, if eaten raw, should be washed very well to make sure that it does not contain any germs. Vegetables and fruit should be as fresh as possible, because vitamins are lost in storage. Cut fruit should be eaten quickly as these too lose their essential vitamins if kept exposed.



*Salads are good for us*



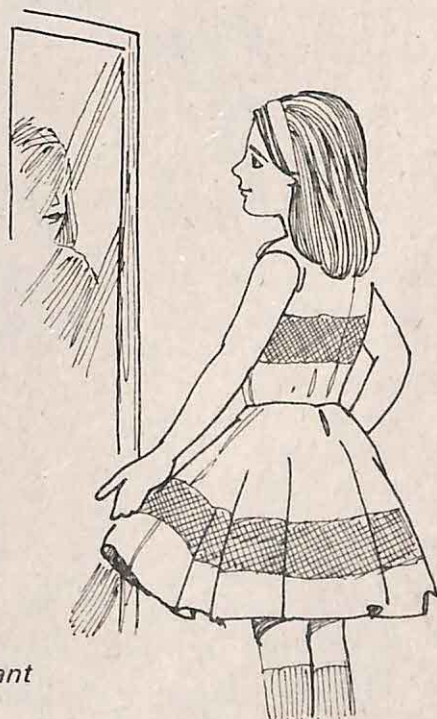
*Some foods need to be cooked*

Children should cultivate good habits:

1. Children should learn to keep their bodies and clothes very clean. This includes personal belongings like towels, handkerchiefs, socks and shoes.

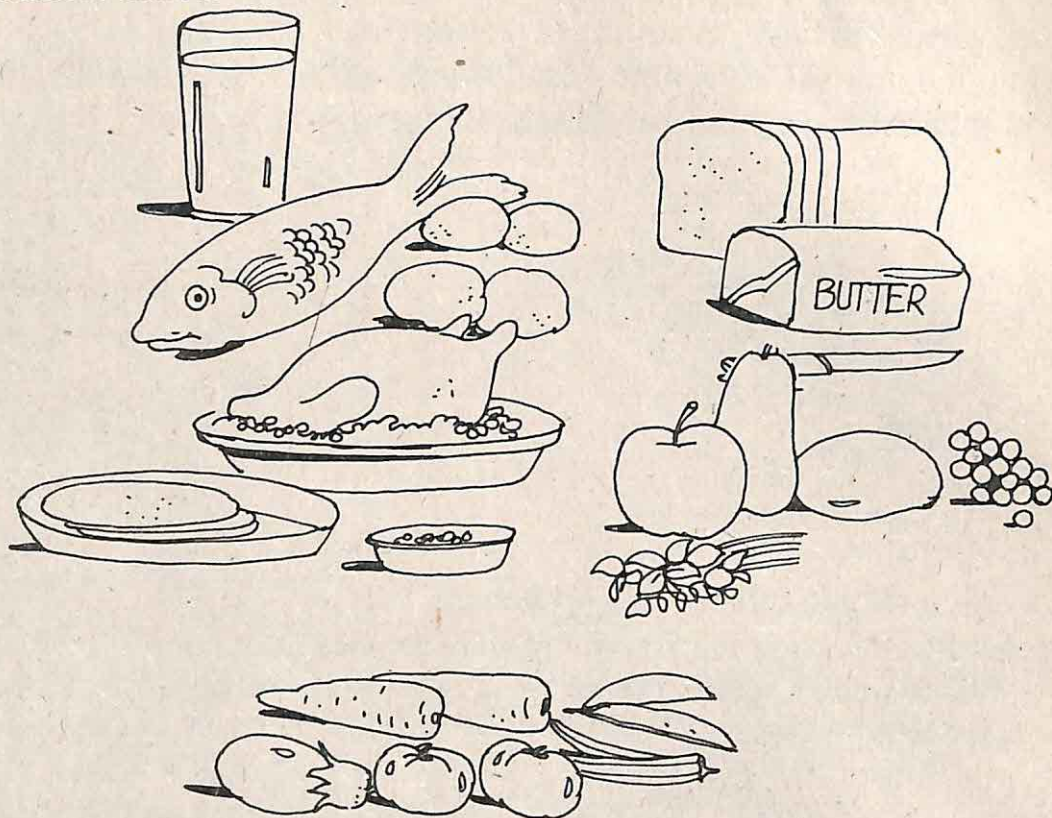


*Cleanliness is important*



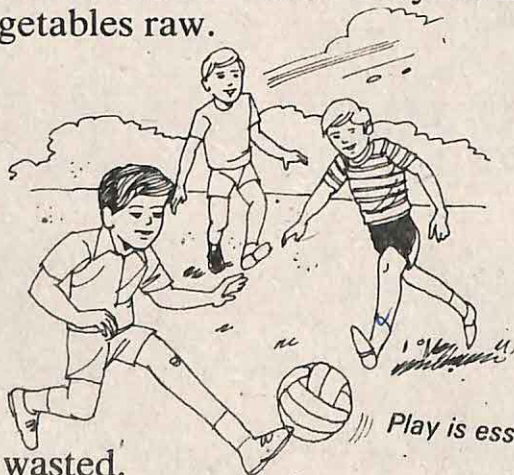


2. They should eat properly cooked, healthy food every day at reasonable times.



*Children should eat certain foods*

3. They must learn to eat all kinds of food. They must learn to eat certain fruits and vegetables raw.



*Play is essential*

4. Food should not be wasted.  
5. They should play and mix with other children and be co-operative.





*We have to wash*

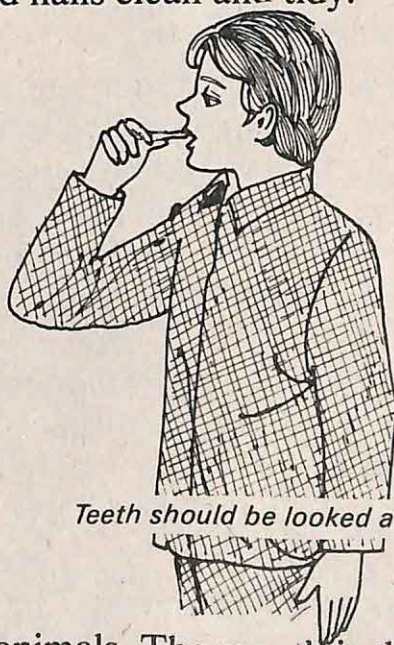


*Nails should be clean*

6. They must develop regular bowel habits and make sure they have a motion everyday.
7. They must wash themselves with soap and water after using the toilet.
8. They must keep their teeth, hair and nails clean and tidy.



*Hair should be combed*



*Teeth should be looked after*

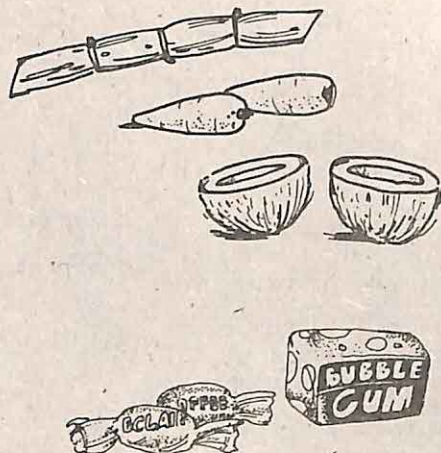
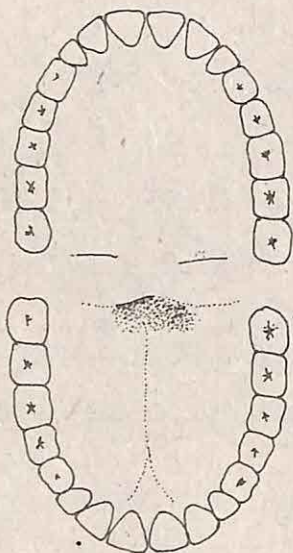
## **Tooth**

Teeth are essential both to man and animals. The mouth is the beginning of the digestive system. If our teeth are to last, we have to learn about them and learn also how to care for them.



## Different kinds of teeth

Man is an omnivore. He eats both plants and animal food. So he has all the types of teeth — biting teeth, tearing teeth and grinding, or chewing, teeth.



*Teeth should be looked after.*

## Use and care of teeth

Teeth are very useful for cutting, tearing and chewing our food. They also give shape to our faces and help us to talk. When we clean our teeth, the gums should also be cleaned and massaged. Eating fibrous fruit and vegetables is as important as cleaning our teeth with toothpaste or toothpowder. Carrot, coconut, sugar-cane, etc. give the teeth the exercise they need, because most of the food we eat is cooked and does not need chewing. But chewing gum is bad for our teeth and stomachs. Teeth must be protected against tooth decay. If teeth are irregular, they must be set right by a dentist.

## Things to remember

1. Keeping the body clean, eating good food, doing physical exercise, keeping the mind healthy should all be part of our daily routine.



2. We must eat correct proportions of protecting food, body-building food, energy-giving food, etc. They are grouped as minerals and vitamins, proteins and carbohydrates and fats respectively.
3. We must eat clean and healthy food.
4. Raw vegetables and fruit provide us with all the vitamins our bodies need.
6. Teeth help us to chew our food properly and give proper shape to our face.
7. Teeth and gums must be given proper exercise to keep them healthy and strong. Chewing fibrous food materials such as carrot, sugar-cane, coconut, etc. do this job. Chewing gum harms our bodies.
8. Children should have regular bowel habits.
9. Children must learn to be friendly and considerate of everybody's feelings.

### **Things to do**

To learn how to help

- a. Help in buying and cleaning vegetables and fruit
- b. Learn to keep your things in order

### **FOR THE CLASS DISPLAY BOARD**

- a. Collect pictures of various kinds of food. Group and label them. Then pin them on to your class display board.
- b. Hang pictures of children doing various types of exercise and playing different games.



## Exercises

1. Answer briefly:
  - a. What are the different types of food? Give two examples of each type.
  - b. How can we give proper exercise to our teeth and gums?
  - c. Why should we eat certain fruits and vegetables raw?
  - d. Write any three good habits you have cultivated. Why do you consider them good and useful?
  - e. Name any three habits you have, which you want to change or improve.
2. Cut out the wrong answers.
  - a. Foodgrains/pulses contain proteins.
  - b. Tomatoes/brinjals should be eaten raw because they are rich in vitamins.
  - c. Man/cow/cat has all three kinds of teeth because he/it/it is an omnivore.
  - d. Grapes/carrots contain fibrous food material.
  - e. Nuts/fruits contain fat.
3. Give the other names for the following:
  - a. body-building foods .....
  - b. energy-giving foods .....
  - c. protective foods ..... and .....



## 13. Man and his tools

How do you carry your books and lunch basket to school? How do you play football? You are 'spending energy' to do these jobs and this energy you get by doing 'work', using your muscular strength or 'force'.

What is force? A force is a 'push' or a 'pull' which can change the motion of movement of a body.



**Work**

*Using force*

When you throw a ball high into the air, it comes down because earth pulls the ball towards it. This pull is called the force of gravity. When you lift up your school bag filled with books, you lift it up against the force of gravity, using your muscular strength or force. Thus by applying muscular force and spending muscular energy you do work — the act of lifting your school bag filled with books. So, when force is used to help man to accomplish something, like lifting a bag, it is called work.



## Use of tools

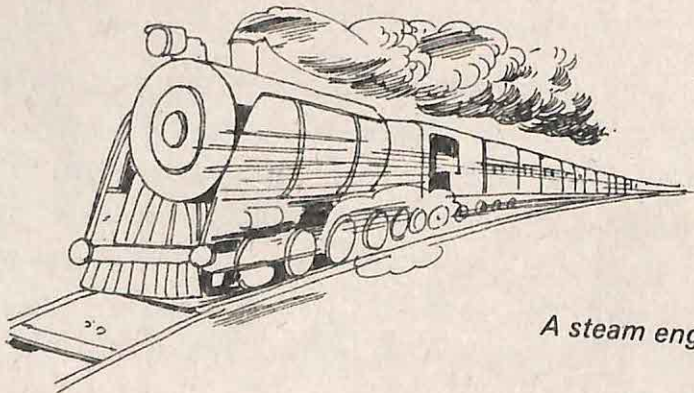
Man has learnt through experience that his muscular force is not enough for doing work that requires a great deal of energy. So he learnt ways of multiplying his physical strength. He has learned to change small forces into big ones and big forces into small ones. He has invented machines or tools to make objects move faster or slower, according to the force required to do work.



*Man learned to multiply force*

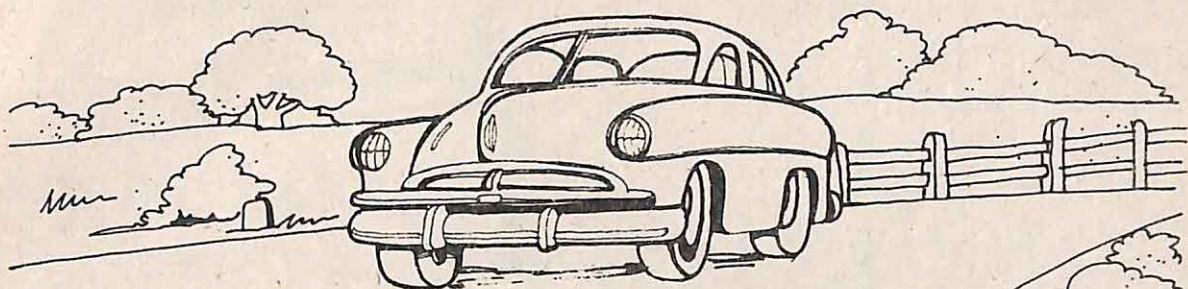
## The Machine Age

We now live in a machine age, where most of our work is done both by simple and complicated machines. The steam engine and the



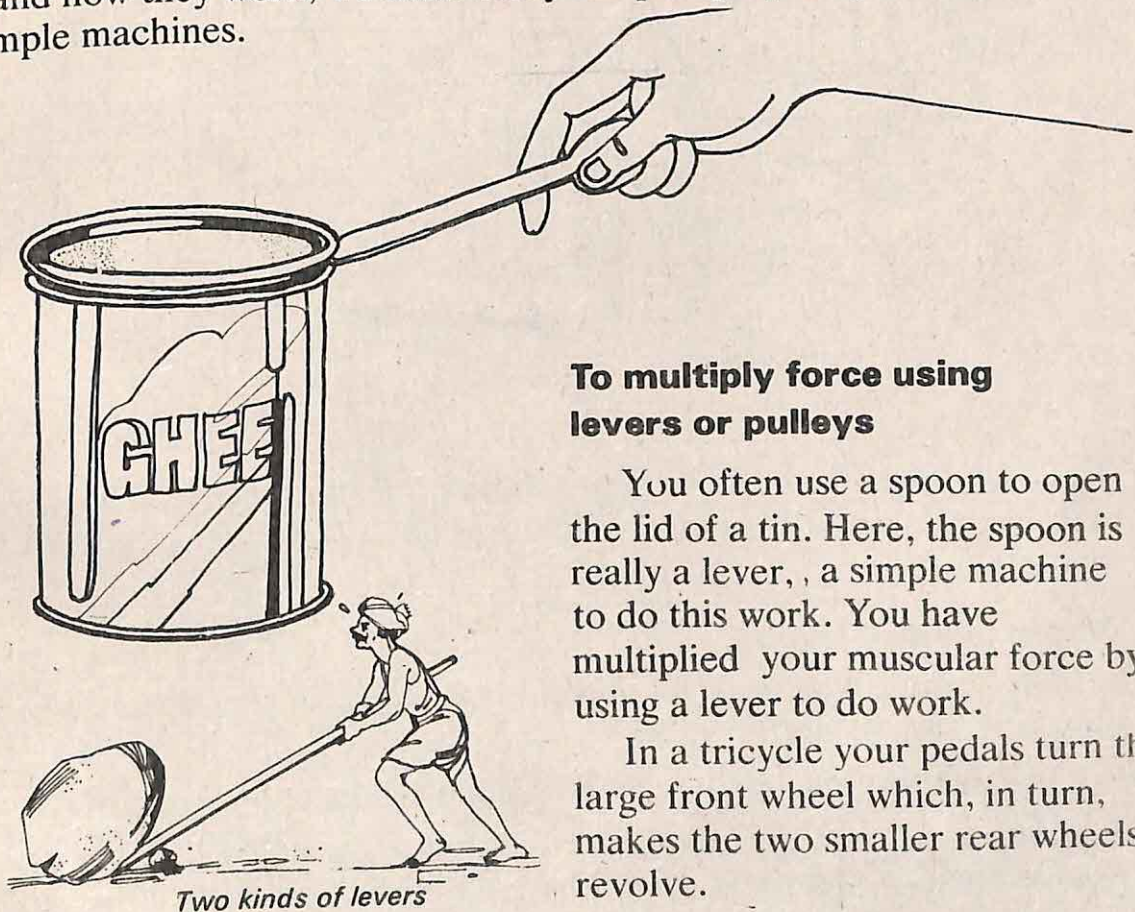
*A steam engine*





*A car runs on its engine*

automobile engine are examples of complicated machines. To understand how they work, we must study the part played by force in simple machines.



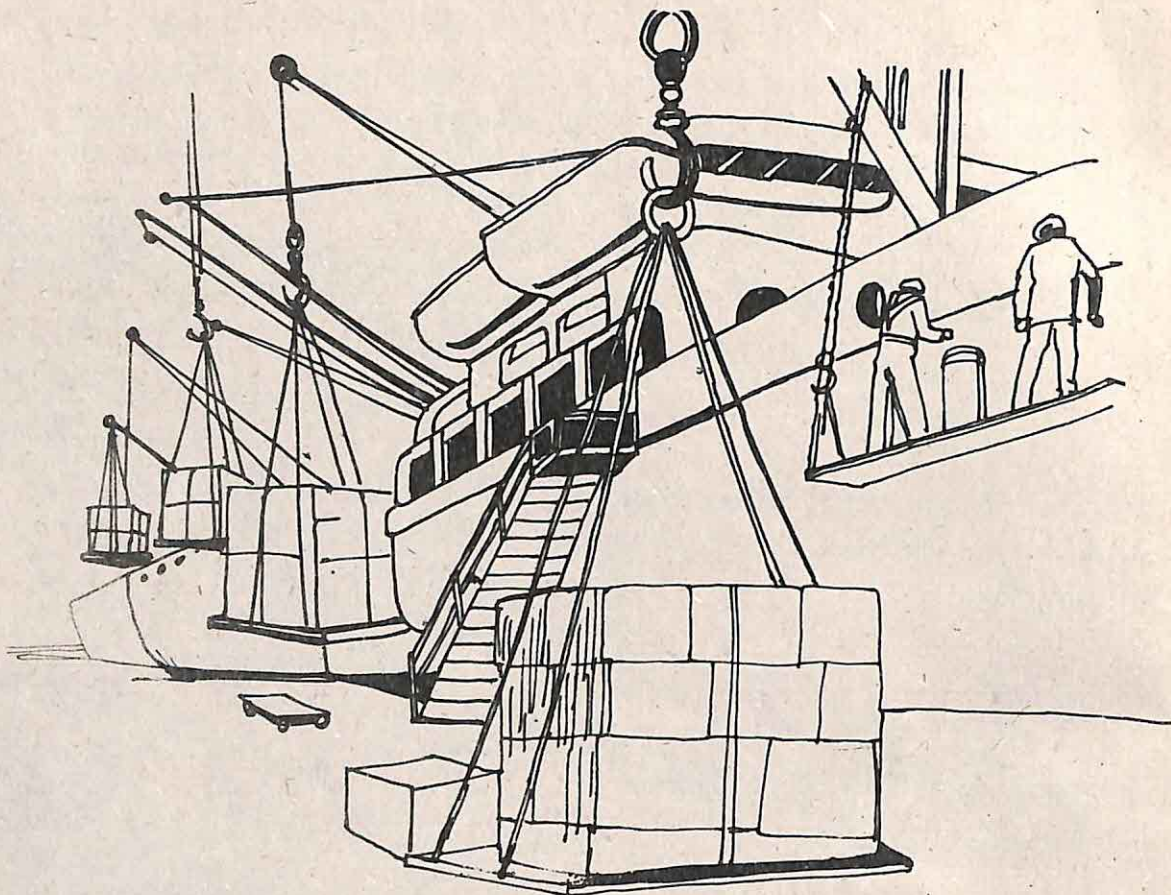
### **To multiply force using levers or pulleys**

You often use a spoon to open the lid of a tin. Here, the spoon is really a lever, a simple machine to do this work. You have multiplied your muscular force by using a lever to do work.

In a tricycle your pedals turn the large front wheel which, in turn, makes the two smaller rear wheels revolve.

A labourer uses a small stone to lift or shift a heavy stone while laying a road. He uses a crowbar as a lever when he does this work.





*Pulleys multiply force*

In a harbour, the crane lifts very heavy objects while loading or unloading a ship. The crane has many pulleys. Here we use pulleys to multiply force.

### **Where is work done?**

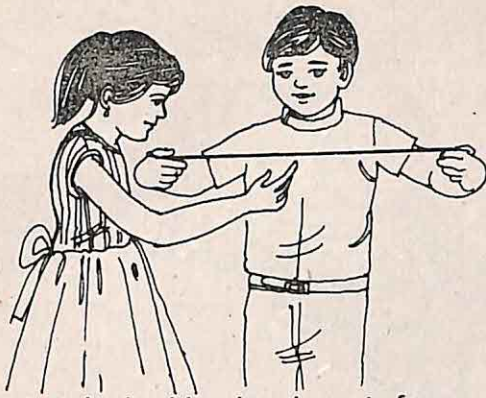
Work is done whenever an object is moved through a distance by a force.

In all the examples above, work is done by the application of force.

So we see that simple machines like the spoon which acts as a lever, the front wheel of a tricycle and the pulleys in a crane, do work.

Another way of doing work is by stretching. This creates a tension which exerts force.

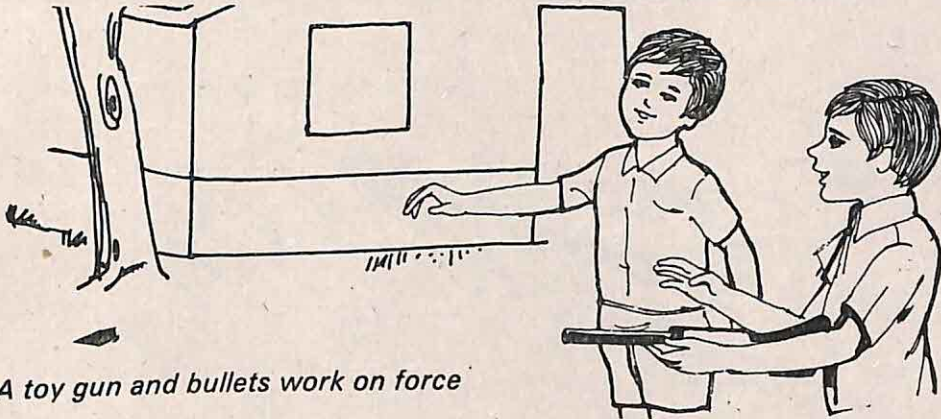




*A stretched rubber band exerts force*

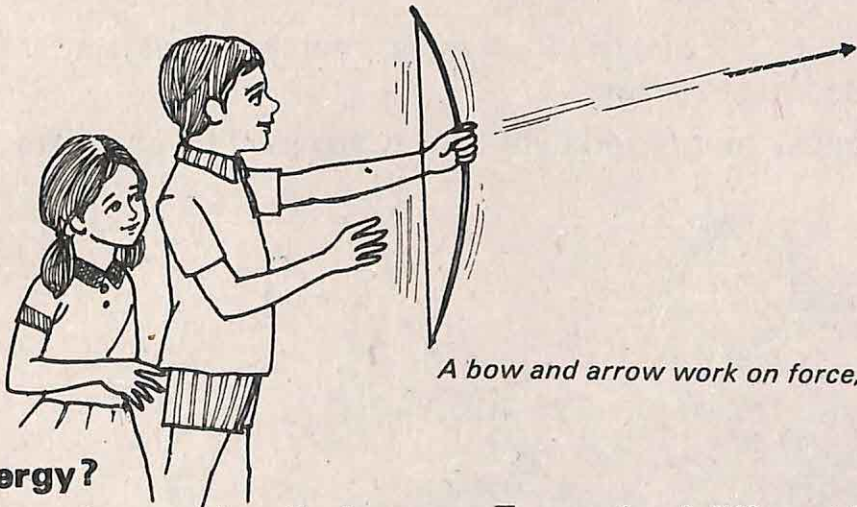
1. A stretched rubber band exerts force on a piece of stone kept on one side of it and when released, sends the stone shooting to a distance.

2. Similarly, a stretched spring in a toy gun when released shoots the bullet to a distance.



*A toy gun and bullets work on force*

3. A bent bow, sends an arrow flying through the air.



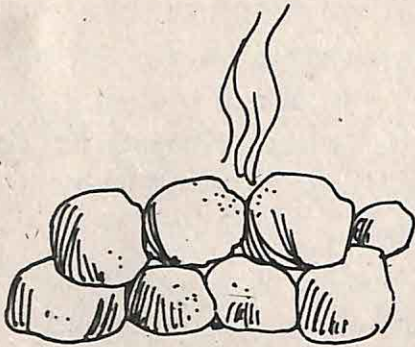
*A bow and arrow work on force, too.*

## **What is energy?**

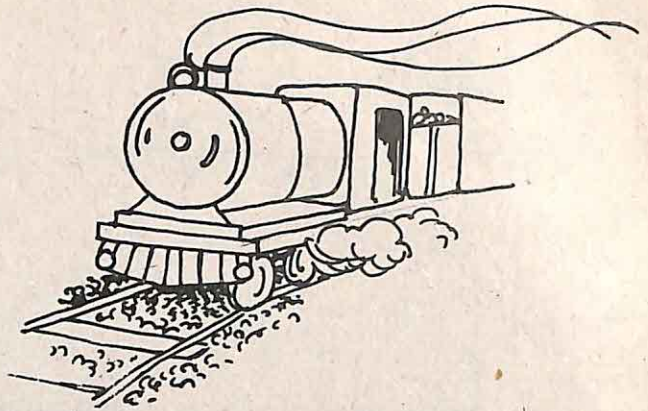
The ability to do work is called energy. Energy is of different kinds.

When you draw water from the well, you use mechanical energy against the force of gravity to lift a pail of water from the well.

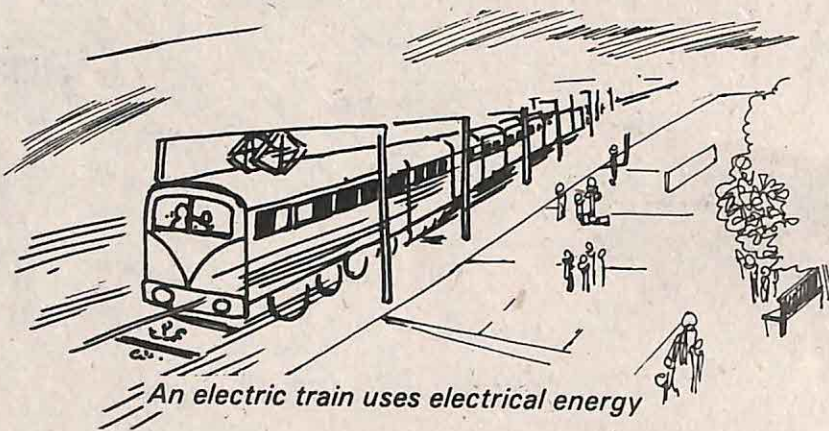




*Coal produces heat-energy*



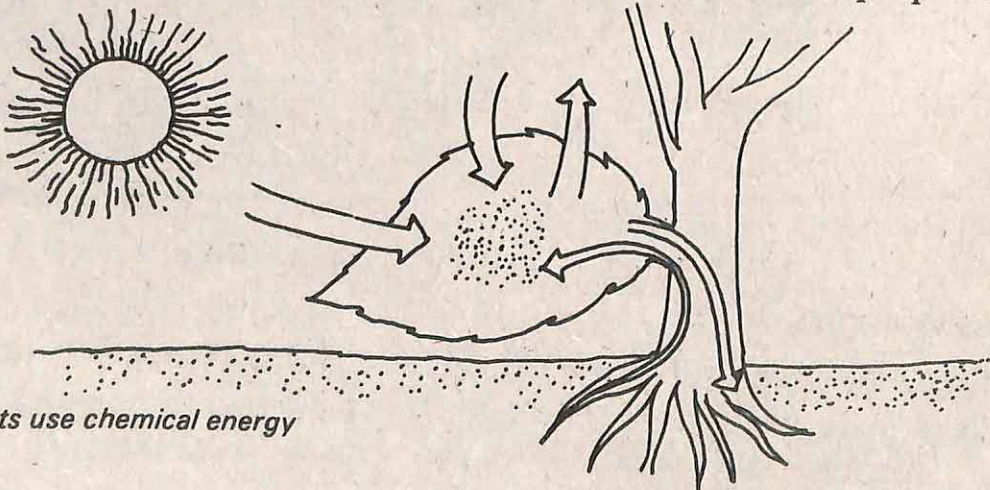
Burning coal produces enormous heat energy to make the steam engine work.



*An electric train uses electrical energy*

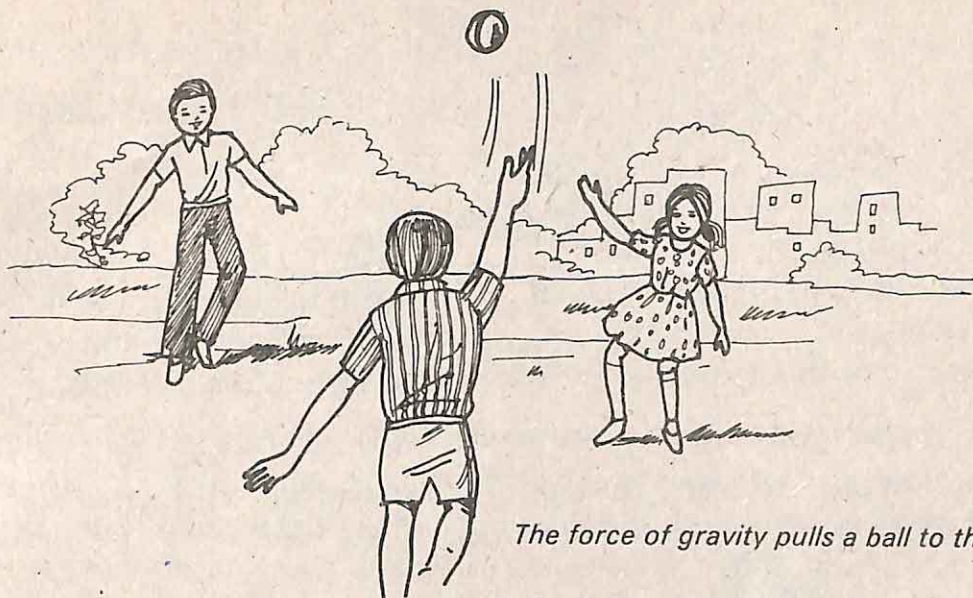
The engine of electric train pulls a number of cars attached to it, using electrical energy.

Chemical energy and light-energy are used by plants for preparing starch.



*Plants use chemical energy*



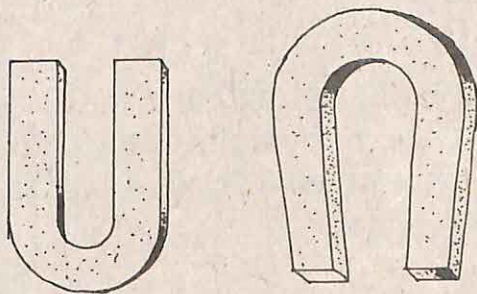
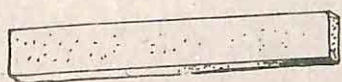


*The force of gravity pulls a ball to the earth*

You have already learnt that a ball thrown upwards is brought down by the force of gravity.

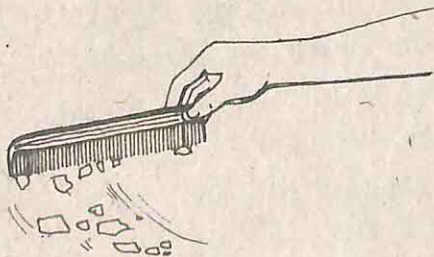
From the following simple experiments you can see how force is exerted by

1. frictional electricity
2. magnets



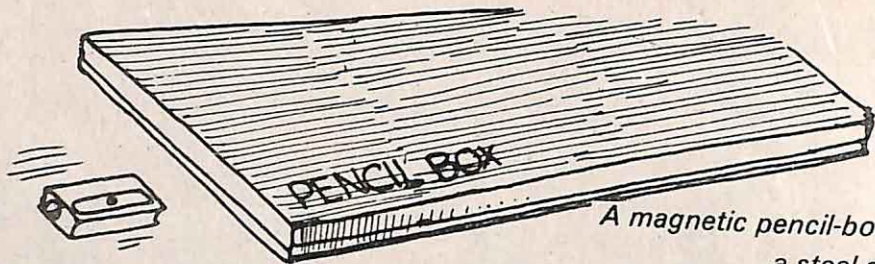
*Different magnets*

*Bits of paper fly towards the comb*



1. Rub a plastic comb vigorously with a piece of silk. Hold it over tiny bits of paper. You can see the bits of paper flying towards the comb. Rubbing with silk causes frictional electricity.





*A magnetic pencil-box attracts a steel sharpener*

2. Do you have a magnetic pencil box? If you bring a steel pencil-sharpener close to the magnet, you find it clings to the magnet. Magnetic force attracts objects made of iron and steel.

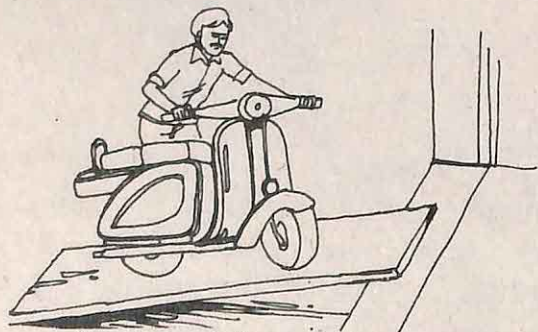
### **Use of simple machines in everyday life**

Just as we use lever and the pulleys to make our work easy we use several other machines to help us in our daily life.



*Weigh ordinary objects*

We make use of a spring balance to weigh objects. A spring balance will show you how to compare weights of common objects in your classroom. If you weigh a book, a pencil box, a tiffin box, you can compare the weights.



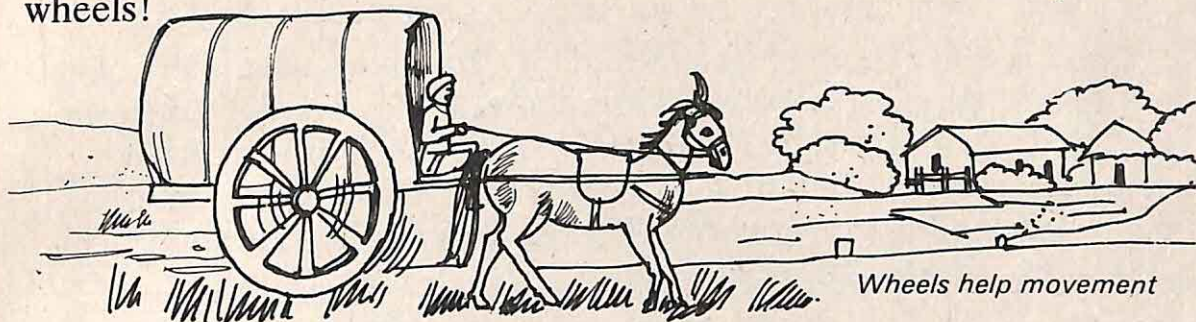
*A scooter is brought in on a plane*

Sometimes, a scooter or a cycle is brought into the verandah of the house on a wooden plank. This is called an inclined plane. The slide you love to play on is another example of an inclined plane.

We make use of wheels to make work easier. Cars, cycles, bullock carts are all provided with wheels.

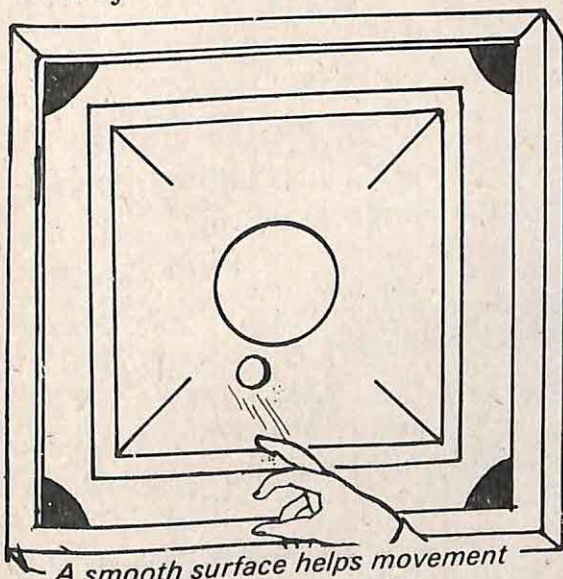


Imagine how difficult it would be for a horse to pull a cart without wheels!



When you play carrom, why do you sprinkle powder on the board? Try to play without using powder. Isn't it very difficult to strike the coins when the board is rough? What does the powder do? It makes the surface of the wooden board so smooth that you pocket the coins easily.

1. Objects find it difficult to move on rough surfaces.
2. Objects move easily on wheels and rollers.
3. Objects move easily on smooth surfaces.



### **Use of measurements**

*Which line is longer?*

Look at the two lines drawn in the figures. Which of them is longer?

The vertical line appears to be longer. But only actual measurement with a ruler can show you which is longer.



## 1. Measurement of length

How do you measure a line you draw in your notebook?

Don't you make use of a ruler to do it? To do this accurately, you must place the ruler or scale on its edge along the line to be measured and place your eyes right above the line. The scale is marked in centimetres and millimetres. You know that 10 millimetres (mm) make one centimetre (cm) and 100 cm make one metre (m). 100 metres make a kilometre (km).

Measurement of length is made in kilometres, metres, centimetres and millimetres.

## 2. Measurement of volume

You know that a milk sachet contains 0.5 litre of milk. You buy oil, milk in litres. The petrol that you put in your car or scooter is measured in litres. 1000 millilitres (ml) make one litre.

Measurement of volume is in litres and millilitres.

## 3. Measurement of time

You know when it is time for your breakfast and whether you have enough time to get ready to go to school. You look at a clock or a wrist watch to find out the time. In a clock you see the minute hand, the long hand, and the hour hand, the short hand. You know that sixty seconds make one minute and sixty minutes make one hour.

### **Things to remember**

1. A force is a push or pull which can change the motion of a body.

We can multiply a force with the help of levers and pulleys.

2. We make use of measuring tools and simple machines to make our work easy.

3. Levers, pulleys, inclined planes, wheels and rollers are simple machines.



4. Work is done whenever an object is moved through a distance by a force.
5. The ability to do work is called energy.
6. Energy is of different kinds — mechanical energy, heat energy, electrical energy, chemical energy, light energy.
7. The force of gravity pulls objects towards it.
8. Friction, or rubbing produces frictional electricity.
9. A magnet produces magnetic force with which it attracts objects made of iron and steel.
10. Objects move easily on smooth surfaces.
11. Objects have difficulty in moving on rough surfaces.
12. Objects move easily on wheels and rollers.
13. We make use of a scale for measuring length, a litre can for measuring volume and a clock for measuring time.

### **Things to do**

1. Do the simple experiments given in this lesson on your own. This gives you better understanding and confidence.
2. Find out how your toys with levers, pulleys, wheels rollers work.
3. Measure the length and breadth of your pencil box, desk with your scale.
4. Use litre and millilitre cans to measure how much water your water bottle can hold.
5. Learn to tell the time on a clock. Sixty seconds in an hour are divided into twelve equal parts, each with five minutes.

### **FOR YOUR CLASS DISPLAY BOARD**

Take a cardboard and cut it into the shape of a clock. Show the hour hand and minute hand. Divide a circle into twelve equal parts, each part showing five minutes. Display it in your classroom.



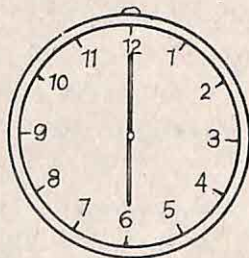
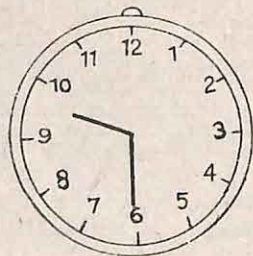
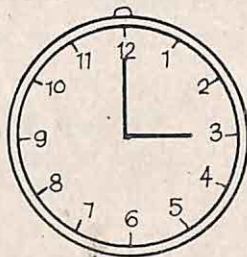
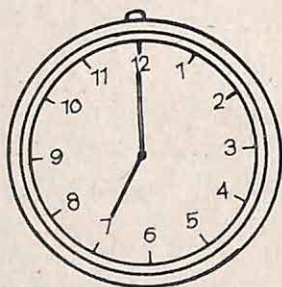
## Exercises

### 1. Fill in the blanks:

- a. You use ..... force to lift your school bag.
- b. We can multiply a force by using ..... or .....
- c. You turn the smaller ..... of your tricycle which turns the larger ..... wheels.
- d. A ..... is used to load and unload cargo in a ship.
- e. A ..... rubber band exerts force.
- f. A ..... balance is used to compare weights of different things.
- g. .... energy drives an electric train.
- h. Green plants prepare starch by using ..... energy.
- i. Rubbing a comb with silk produces ..... electricity.
- j. A ..... attracts iron and steel.

### 2. Solve the following:

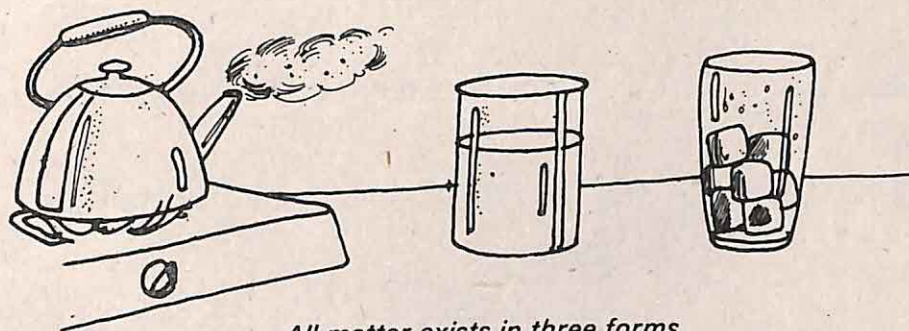
- a. You fill your water bottle using 0.5 litre can. How much water does your bottle hold?
- b. Your small scale has 15 cm marked on it. If you measure the length of your desk by using it five times, what is the length of your desk?
- c. What is the time shown by these clocks:





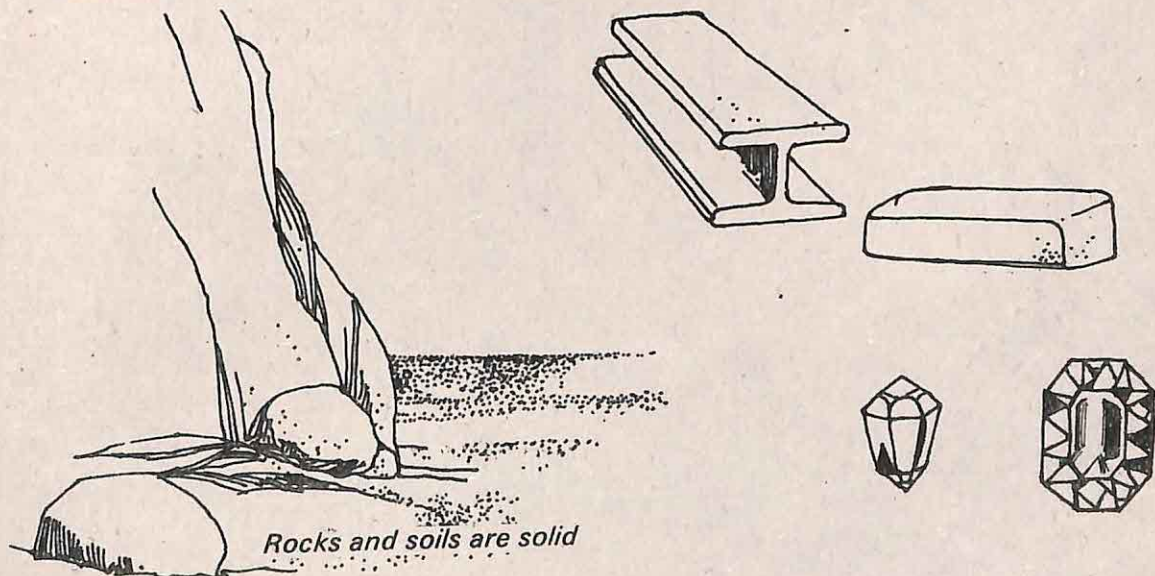
## 14. Properties of matter

You know that water exists in three forms — water vapour which is a gas, water which is a liquid and ice which is a solid. You are now going to learn that all matter on earth takes one of these three forms — solids, liquids and gases.



*All matter exists in three forms*

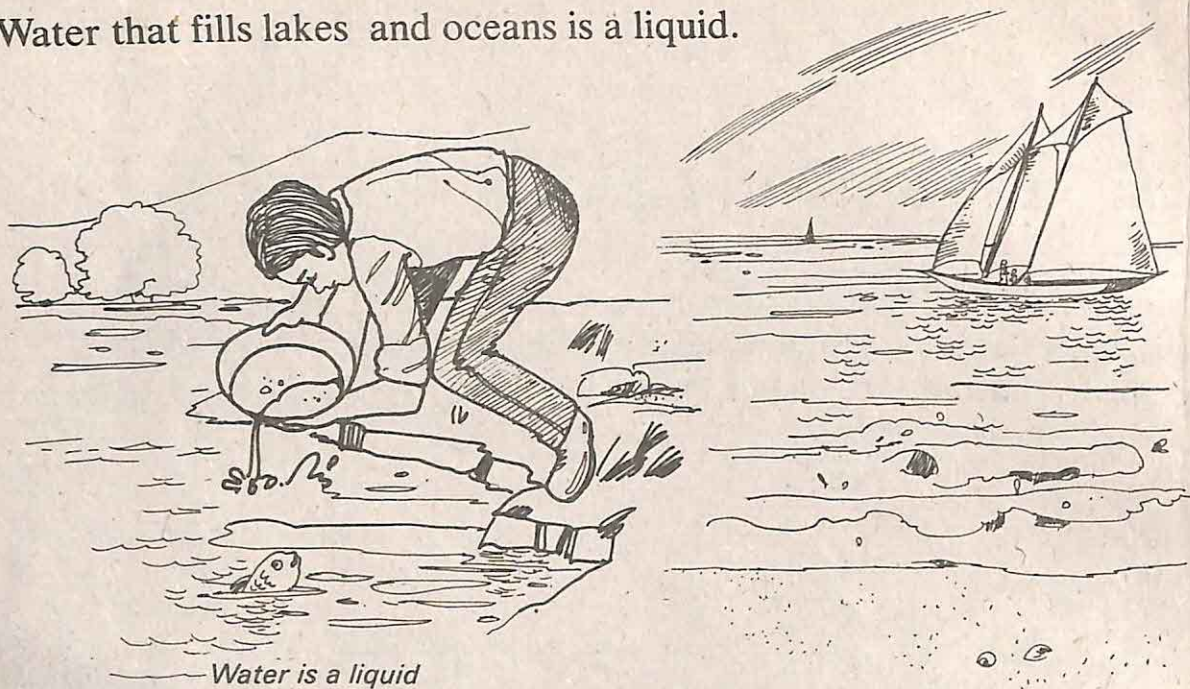
Rocks, soil, minerals, etc. found on earth are all in the form of solids.



*Rocks and soils are solid*

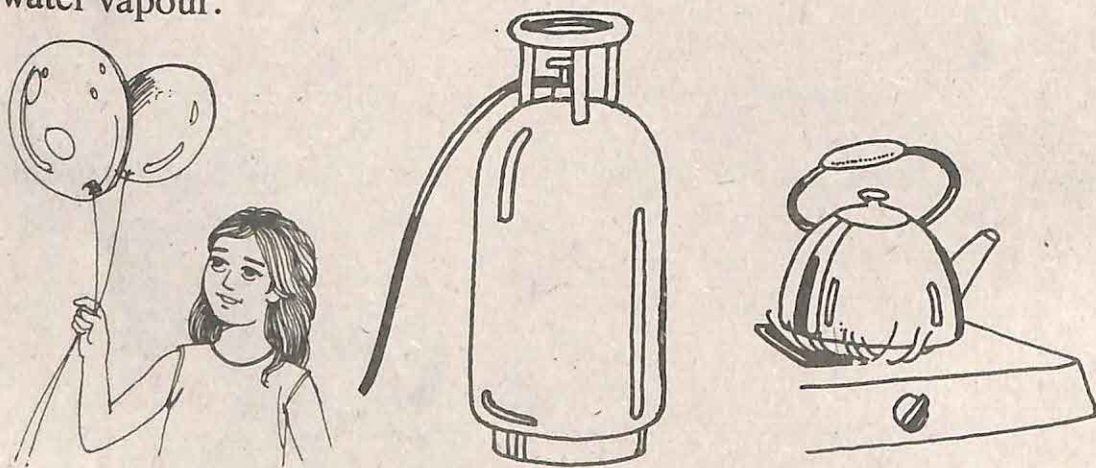


Water that fills lakes and oceans is a liquid.

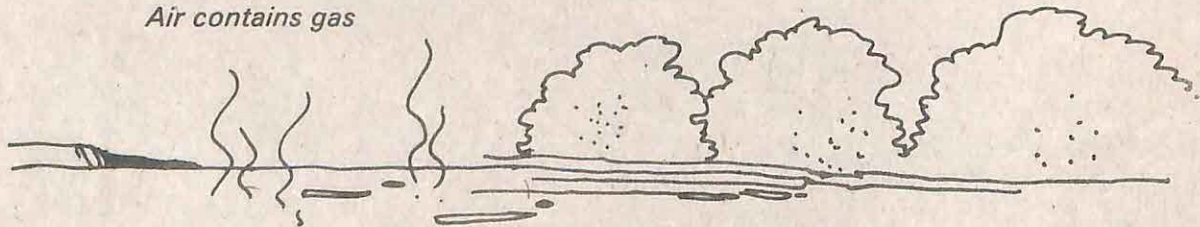


*Water is a liquid*

Air is made up of gases like oxygen, nitrogen, carbon dioxide and water vapour.

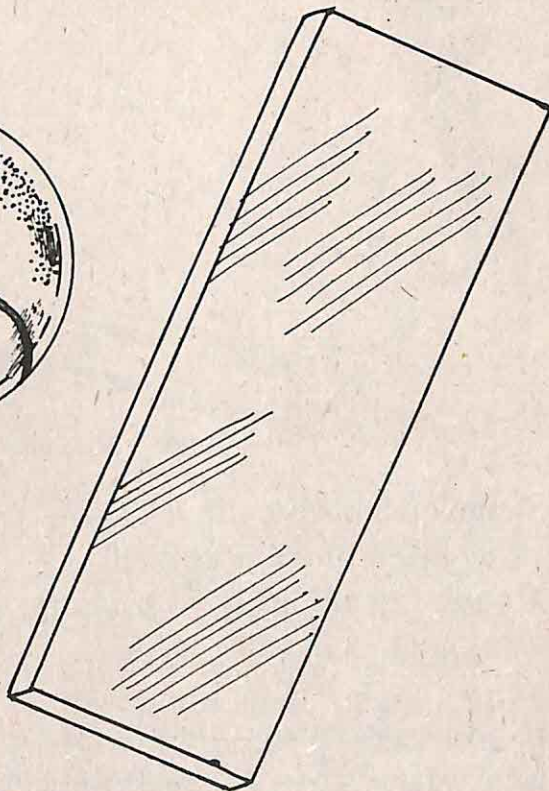
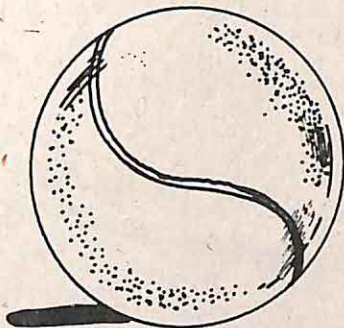
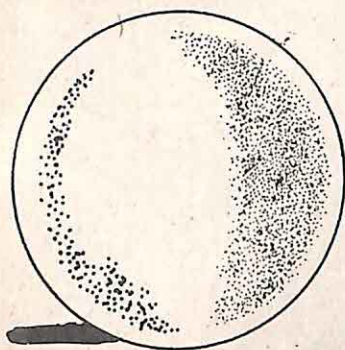


*Air contains gas*

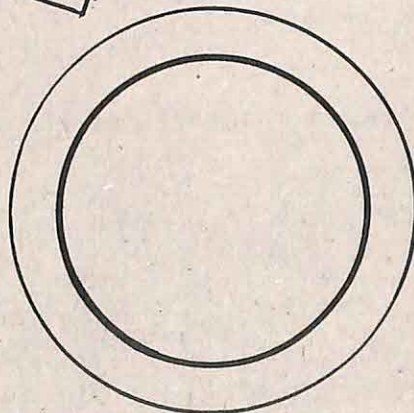
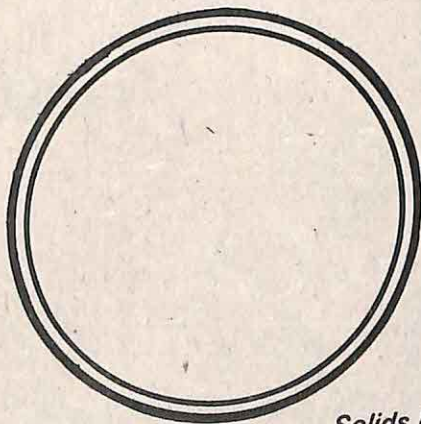
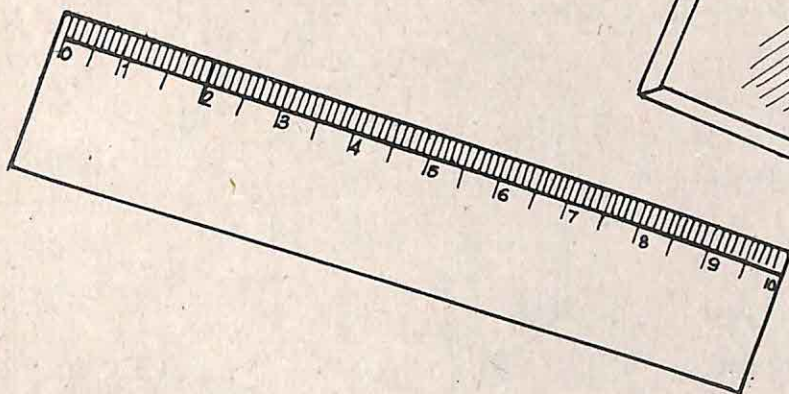




Solids have definite shapes, even if they are different. A ball is round or spherical.



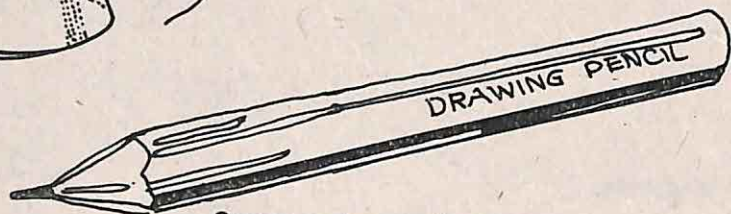
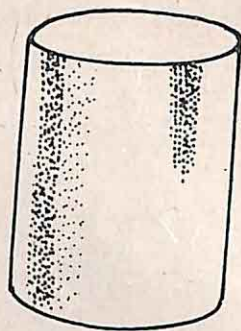
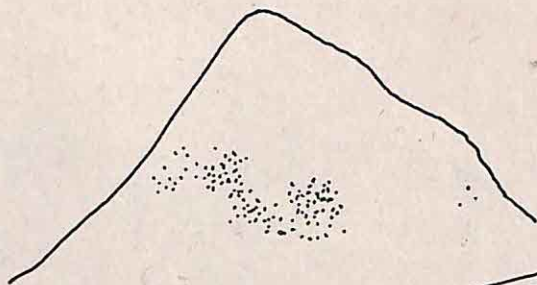
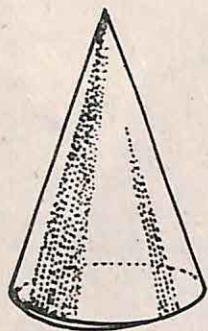
A ruler is flat. A bangle is like a ring.



*Solids have definite shapes*



A mountain is conical.



*Cones, cubes and cylinders*

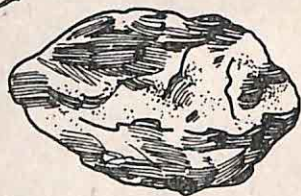
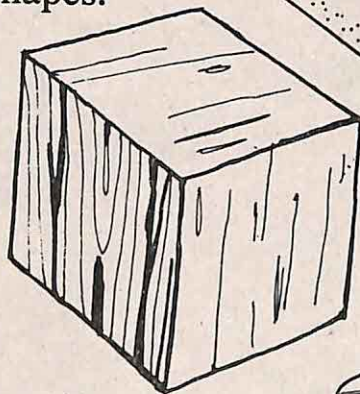
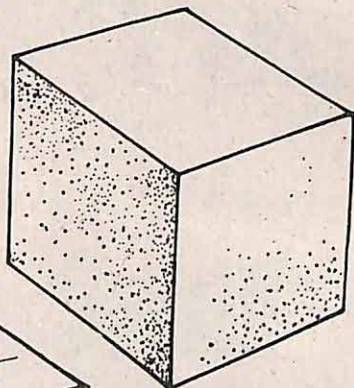
A new pencil is cylindrical.

A wooden block is cubical.

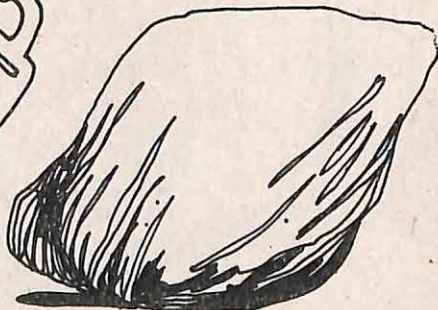
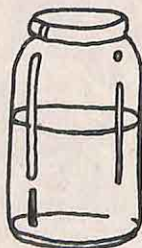
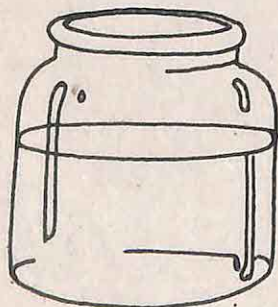
Rocks and stones have irregular shapes.

Liquids can be poured from a higher level to a lower level. Water poured into a vessel takes the shape of the vessel.

Gases do not have any shape. Air fills a balloon. It fills our rooms and fills a huge space around the earth. This is called the atmosphere.



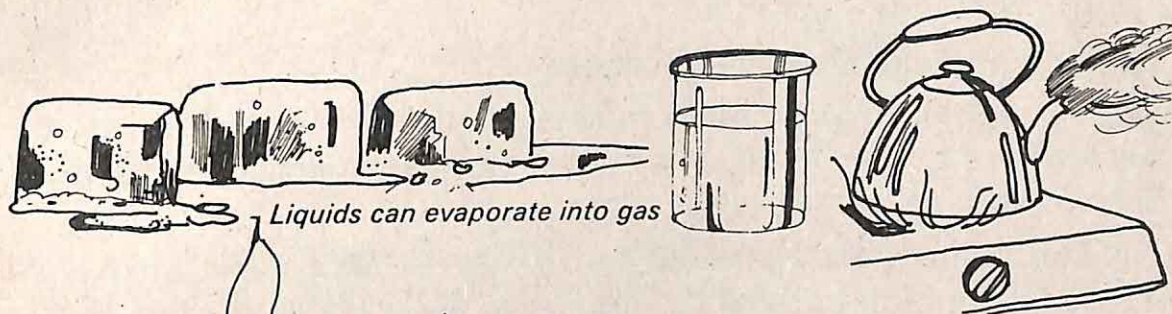
*Liquids take the shape of their containers*



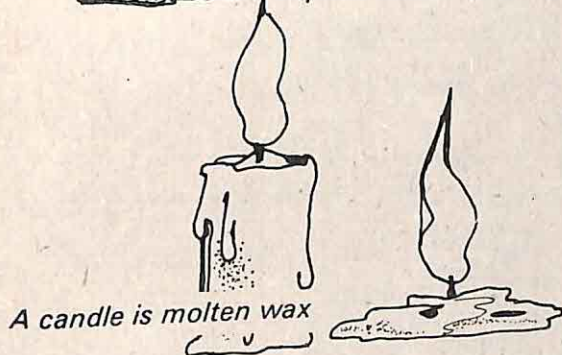


## Change of state of matter

Earlier on you learnt how ice (solid) melts into water (liquid) on heating; water evaporates into water vapour (gas) on heating; water vapour condenses to form water (liquid) on cooling and water freezes to ice (solid) on cooling; for example, in the fridge.



Liquids can evaporate into gas



A candle is molten wax

Similarly, wax melts into a liquid. Hot molten wax evaporates to form vapour of wax which catches fire and burns. This is how a wax candle burns.

**Experiment 1:** Take equal quantities of tap water, well water and water to which a little salt is added. Pour each sample in a bowl and heat it. The water evaporates, leaving behind some substances, called sediment.

Take equal quantities of water





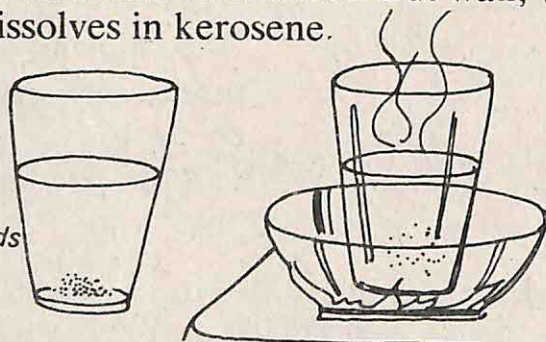
- a. Tap water does not generally leave anything. Sometimes it might leave a little white substance in the bowl. These are the salts dissolved in tap water.
- b. Well water has more salt left in the bowl.
- c. The salt added to water and dissolved in the third bowl is got back after evaporation.

### **Water dissolves many substances**

Sugar dissolves in water. Many minerals found on the earth's crust are soluble in water. Sea water is salty as it has many salts dissolved in it. Salt water is sometimes called saline.

Water cannot dissolve certain substances like wax, stone, chalk. These are known as insoluble substances. But wax, which cannot dissolve in water, dissolves in kerosene.

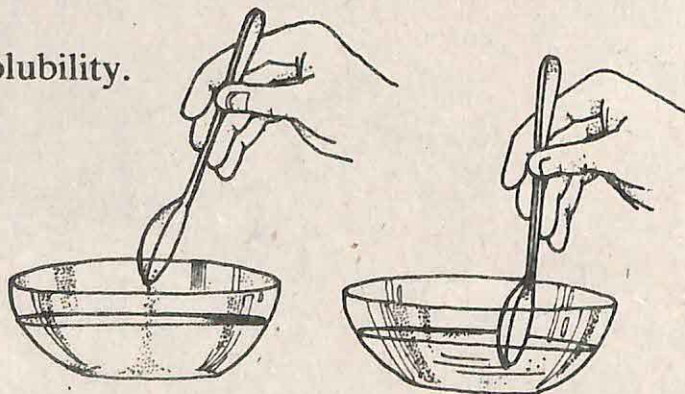
*Different solids  
dissolve in different liquids*



A substance which is soluble in one liquid may be insoluble in another liquid.

Experiment 2: Add salt to a bowl of water. It takes a lot of time to dissolve if left undisturbed. Stir it vigorously. Then it dissolves quickly.

*Stirring helps solubility.*



*Stirring helps solubility*

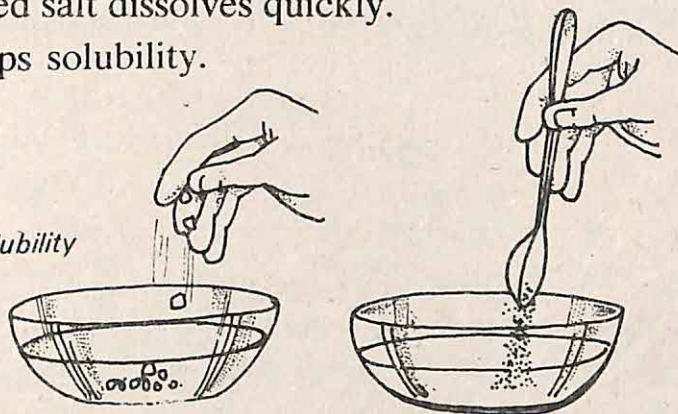


**Experiment 3:** Put equal quantities of big lumps of salt in one bowl and powdered salt in another. Add equal quantities of water. Stir well. Which of them dissolves faster?

Some of the big lumps of salt remain undissolved in spite of stirring whereas powdered salt dissolves quickly.

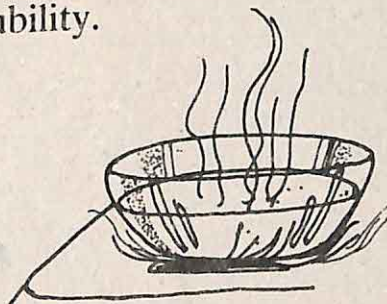
Powdering helps solubility.

*Powdering helps solubility*



**Experiment 4:** Dissolve salt in cold water. Add more salt to it and stir. After some time, some salt will be left undissolved.

Now heat the solution. The salt left underneath begins to dissolve. Heating helps solubility.



*Heating helps solubility*

### **Things to remember**

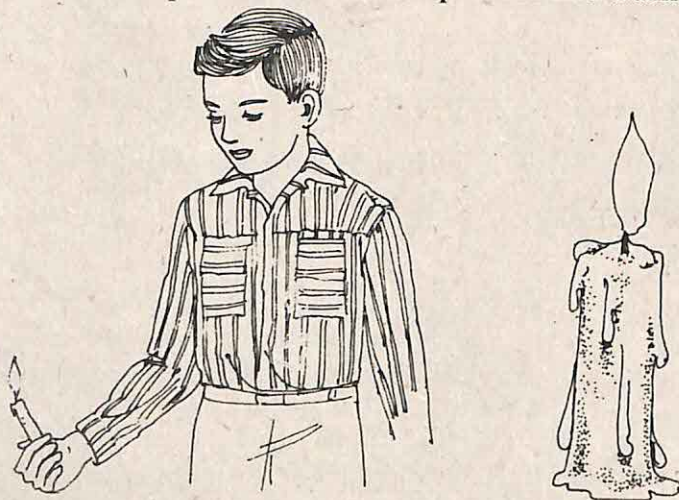
1. Matter exists in different forms — solids, liquids and gases.
2. Solids have definite shape.  
Liquids take the shape of the container they are poured into.  
Gases do not have any shape. They occupy any available space.
3. Solids are of different shapes and sizes.



4. Solids melt into liquids. Liquids evaporate into gases. Gases condense into liquids. Liquids freeze into solids.
5. Many substances dissolve in water.
6. Wax is insoluble in water, but it is soluble in kerosene.
7. Stirring, powdering and heating help solids to dissolve more rapidly in water.

### Things to do

1. Watch how a candle burns. See how the wax melts because of the heat. See how the wick takes in liquid wax which evaporates and burns.



2. Add sugar to a cup of milk. Stir it with a spoon. Taste milk without sugar and with sugar. Which do you like better?
3. How does your mother make sugar candy? Have you noticed that sugar melts into a syrup on heating and cools to form solid candy?

### Exercises

1. Answer the following:
  - a. Mention some shapes of solids you have learnt.



b. Solids have definite shape. What do you know about liquids and gases?

2. Fill in the blanks:

a. Air is a ..... whereas water is a ..... and rock is a .....

b. Rocks are of ..... shapes and sizes.

c. Stirring, powdering and ..... help solids to dissolve more ..... in water.

d. .... dissolves in kerosene.

e. .... dissolves in milk.

3. Match the following:

a. water vapour      solid

d. steam

liquid

b. rock              hot gas

e. salt

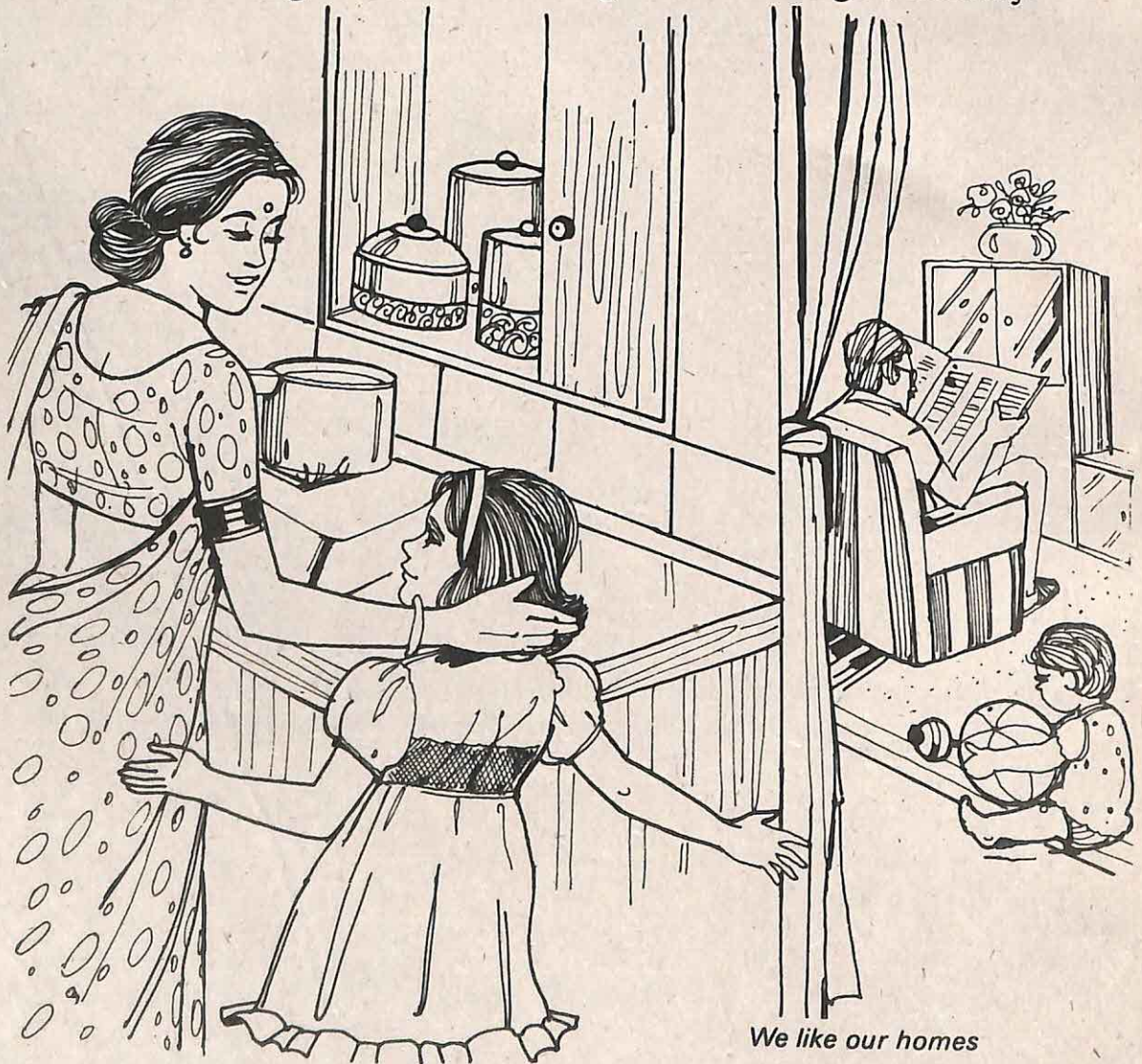
gas

c. milk              soluble in water



## 15. A happy home

Is your family big or small? **How** do you feel being the member of your family? How do you feel about your home? We all feel very proud and happy when we think of our families and homes. Part of the reason for this is our house. Whatever its size, whether it is a flat or a house with a garden, our houses give us a feeling of security.

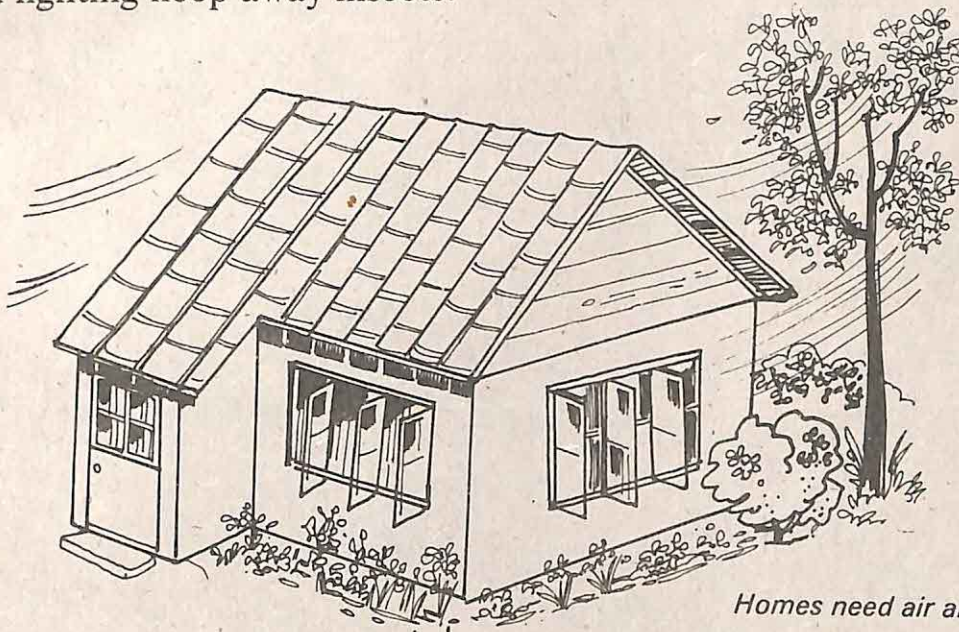


*We like our homes*

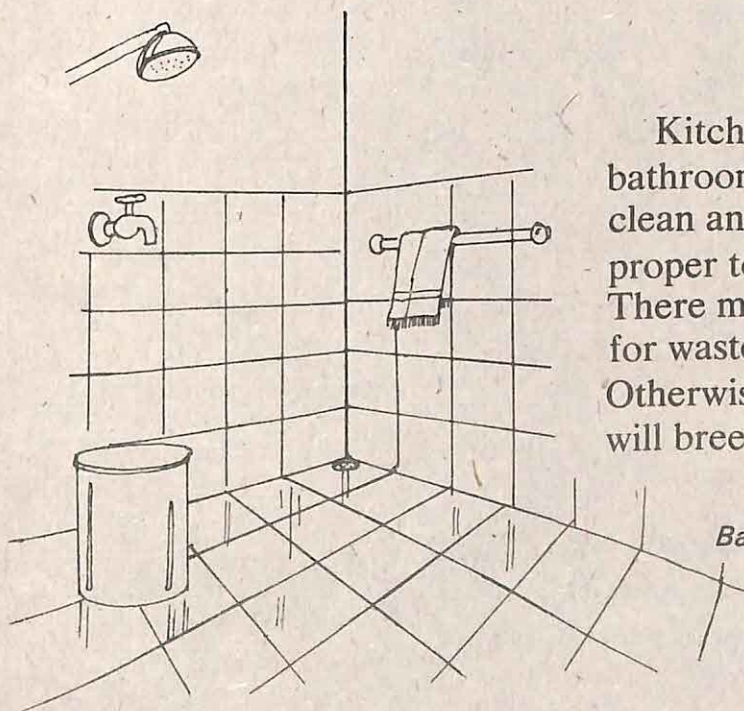


Living in clean surroundings and wearing clean, comfortable clothes are as important. Only then can a person be truly healthy.

A house must have doors and windows to allow free movement of air. Enough sunlight must enter into the house. Proper ventilation and lighting keep away insects.



*Homes need air and light*



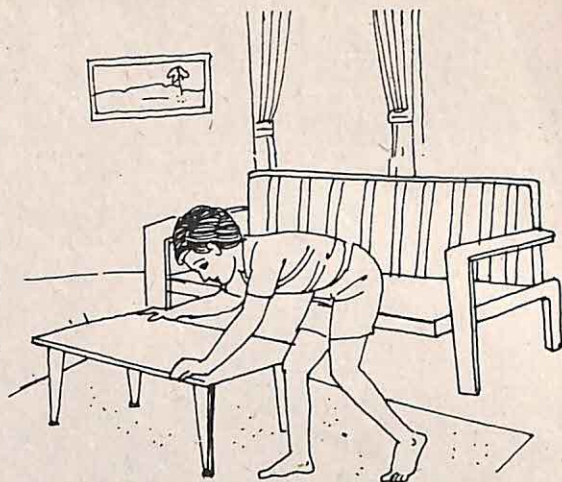
Kitchen floors and the bathrooms should always be kept clean and dry. There must be proper toilet facilities in a house. There must also be proper outlets for waste water to drain off. Otherwise flies and mosquitoes will breed and cause illness.

*Bathrooms should be clean*

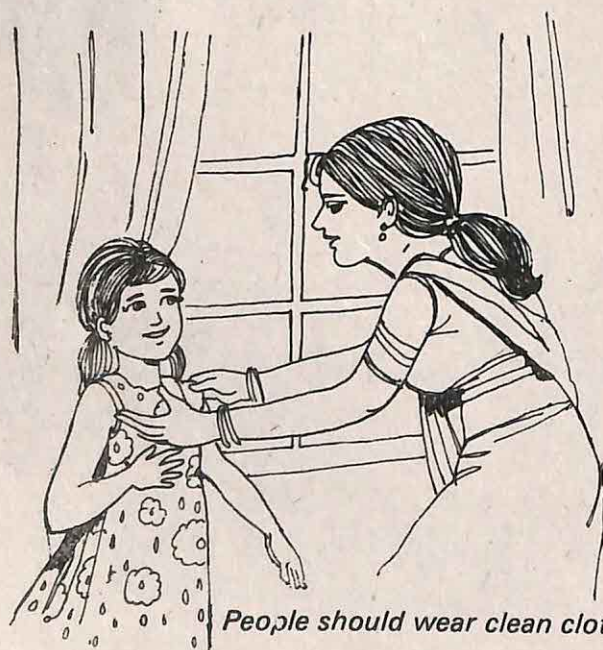




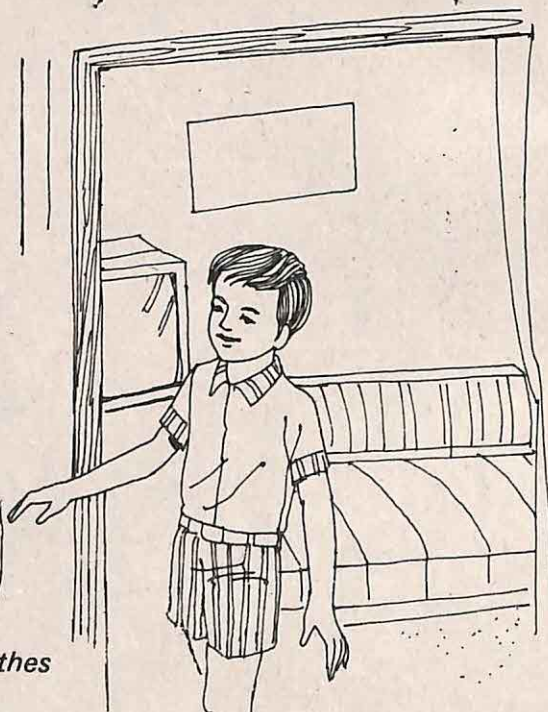
*We should store neatly*



Especially in large cities, since more and more people live in small flats, we have to learn to be efficient in our storage. Things have to be put away and arranged neatly.



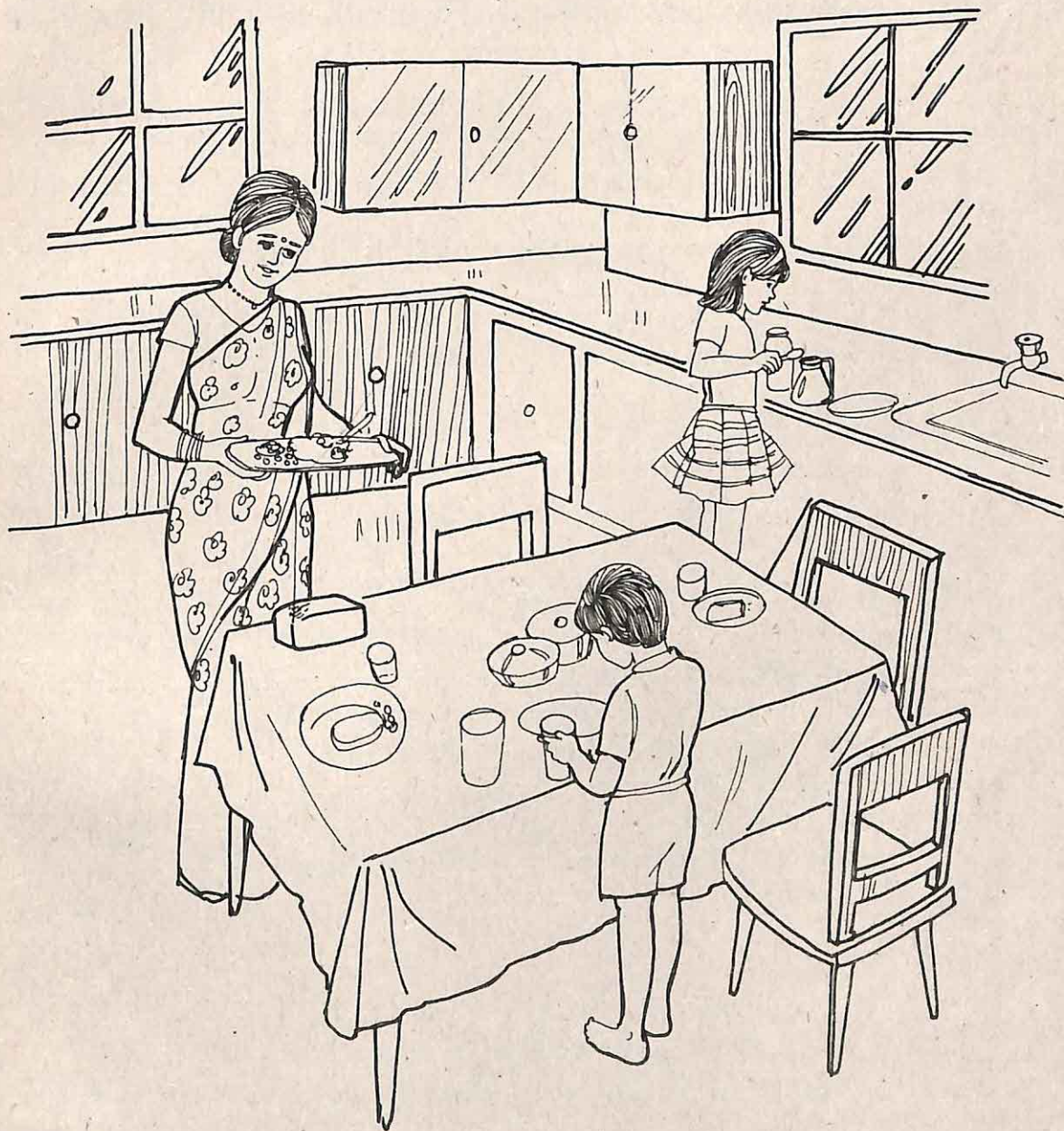
*People should wear clean clothes*



Apart from keeping the house clean, people must wear clean clothes. Even ordinary clothes can look very attractive if they are properly washed. If they are kept well, clothes will last longer.



Everyone in a family should take interest in keeping the house clean and tidy. Children as well as parents must co-operate and work towards a more useful and healthful life.



*Help and co-operation make home a happy place*



### **Things to remember**

1. A healthy body helps people to have a healthy mind.
2. A clean home helps people to be healthy.
3. Clothes must be properly washed and neatly worn.
4. Co-operation within the family makes home an attractive place.

### **Things to do**

1. Write a short note on a happy family you know. Draw their home and colour it. Hang this picture in your classroom.
2. Collect pictures of houses of varied shapes and sizes with beautiful surroundings and display them in your class display board.

### **Exercise**

Answer the following briefly:

1. Where do you live?
2. How many people are there in your family?
3. Who shares the household work with your mother in your family?
4. How do you help your parents in running the home?
5. Write a few sentences about
  - i. how you like your family
  - ii. the kind of clothes you like to wear.

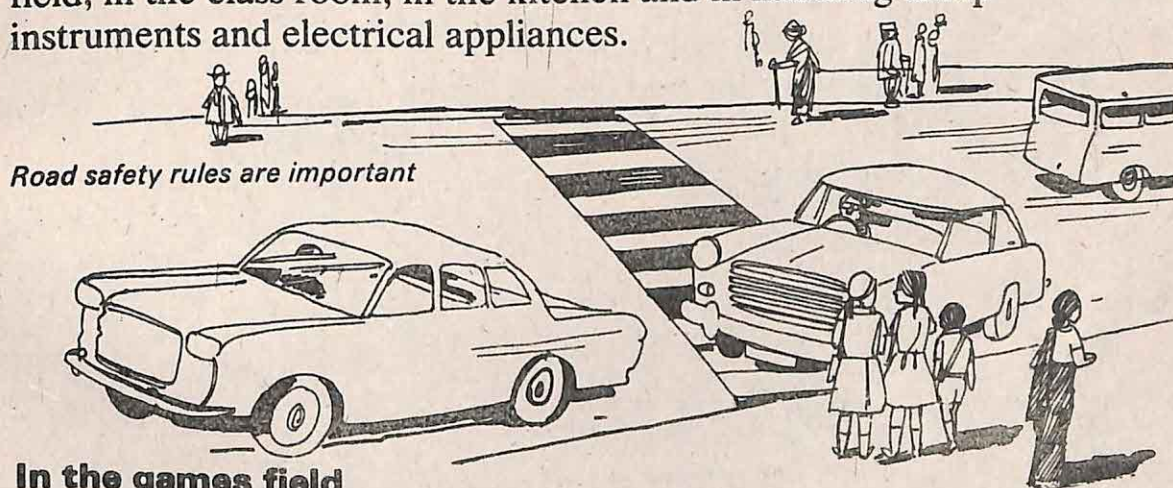


## 16. Safety and first aid

You are very active and enthusiastic children. You spend your energy on the games field and in doing many kinds of work. Because you are totally absorbed in your play, you must be extra careful in order to prevent accidents.

You have already learnt about road safety. You know that you have to cross the road only on the pedestrian, or zebra, crossing. You also know that you have to stop when you see the red signal and go when you see the green signal.

There are safety rules not only on the road but also on the games field, in the class room, in the kitchen and in handling sharp instruments and electrical appliances.



### In the games field

Some do's

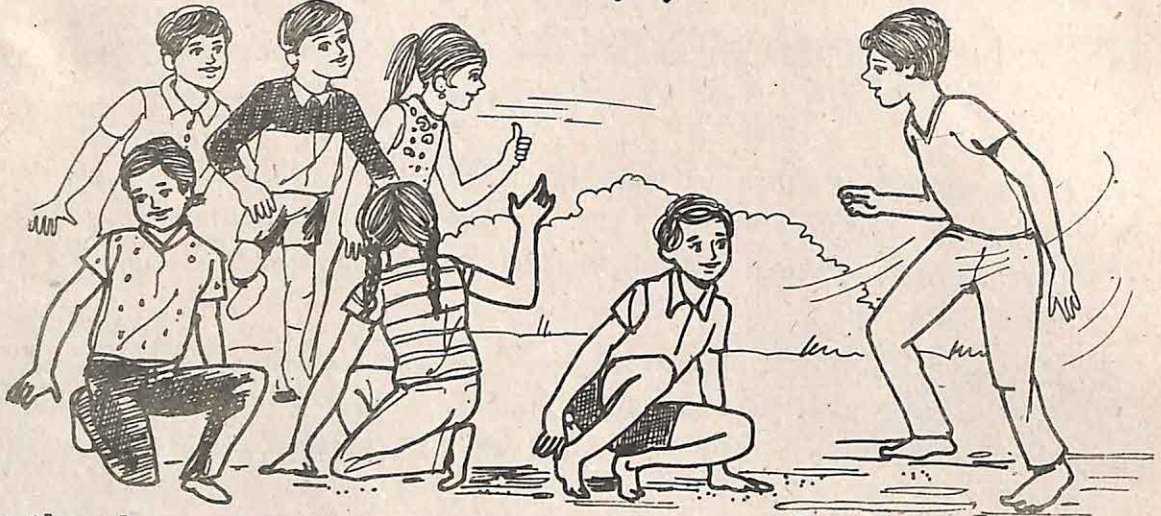
1. Follow the rules of the game you are playing.
2. Carefully follow the instructions given by the teacher.
3. Learn to do exercises properly as it helps you to build up a healthy, strong body.

Some don'ts

1. Never play rough games.



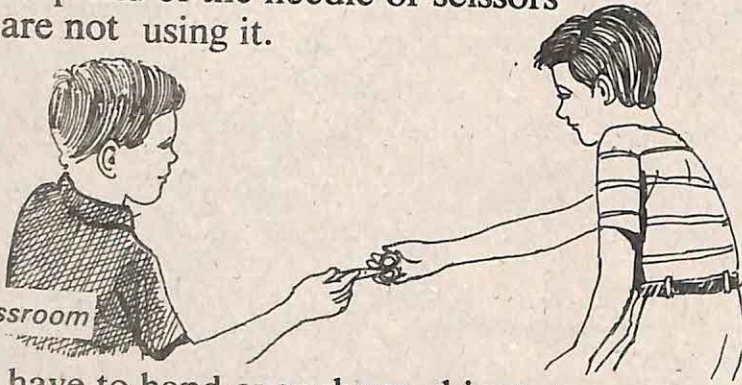
2. Never attack any child without his knowledge or in fun.
  3. Do not push or pull anybody even in fun
- All these things could cause serious injury.



### **In the classroom**

Some do's

1. Use a sharpener to sharpen your pencil.
2. Hold the sharp end of the needle or scissors when you are not using it.



*Safety in the classroom*

3. When you have to hand over sharp objects to another person, hold the sharp end in your palm.

Some don'ts

1. Don't use a blade or knife for sharpening your pencil. You could cut your finger badly.
2. In your handwork class, never make jerky movements with your hands if you are working with scissors or needle and thread or any other sharp instrument.





*Safety in the house*

## **At home**

In the kitchen

Some do's

1. Follow your mother's or any other adult's instructions carefully when working in your house.
2. When you help in the kitchen, only do what you are allowed to do.
3. It is safest to wear cotton clothes in the kitchen.



*These things are dangerous*



Some don'ts

1. Don't go near the fire or meddle with hot things.
2. Never touch anything hot — utensils or cooked food.
3. Don't use a knife unless you have an adult to help.
4. Don't touch or eat anything without knowing what it is.
5. Don't wear frilly, nylon or silk clothes when you go near the fire if needed.



## 2. With electrical appliances

We use electricity for various purposes. We use electric motors, fans, lamps, stoves, ovens, iron and many other things in our homes. Electricity could turn out to be harmful if we are not careful while using it.

Some do's

1. You should be very careful when you use switches or plugs.
2. If you have to handle an electrical appliance, wear rubber footwear or stand on a wooden plank. Then you will not get a shock because electricity cannot pass through rubber and wood.
3. If you notice a short circuit and sparks in a live wire, switch off. Remember to wear rubber slippers or stand on a wooden plank.

Some don'ts

1. Don't touch a switch or a plug with a wet hand. You might get a bad shock.
2. Don't touch the iron when the plug is switched on.



*Electrical appliances need careful handling*



3. Don't meddle with any electrical appliance without adult supervision as you might cut off a wire or damage an important part. If this happens, there could be an accident because of loose contact or short circuit.

### 3. With medicines

#### Some do's

1. Only an adult should give you medicines. You should not take them yourself.
2. Take only the correct dosage prescribed by the doctor.
3. Keep medicines in a safe place.
4. Don't take medicines which are not meant for you.

#### Some don'ts

1. Don't take any medicines without an adult's knowledge.
2. Medicines should be kept in a closed chest or box. You should not handle this without adult help.

*Medicines need adult help*



### First aid for simple wounds

1. Wounds should be cleaned well to remove dust, sand and blood stains with clean water or cottonwool.
2. New wounds should be cleaned well with water to which a few drops of antiseptic like Dettol has been added. This kills germs.



3. Ordinary wounds do not require any bandaging. You can apply an antiseptic cream or cover it up with an antiseptic plaster that allows air to enter. Entry of air is necessary as the oxygen in the air is a quick healer of wounds.
4. Deep wounds require antiseptic as well as neat bandaging, covering the wound with lint or gauze after applying medicine.
5. Go to a doctor if a dangerous wound cannot be bandaged at home.
6. If the doctor prescribes medicines, take these regularly. If wounds are neglected, they could become infected and take a long time to heal.
7. Take an A.T.S. injection within 24 hours. This prevents a serious illness called tetanus.

### **Things to remember**

- 1 Follow the rules for road safety.
2. Never play rough games.
3. Do not attack, push or pull anyone without their knowledge, even in fun.
4. Games should be played according to rules.
5. Learn exercises to build a strong body.
6. Be very careful when you use scissors for cutting out or needle and thread for sewing.
7. Sharpen your pencils with a sharpener.
8. Never go anywhere near the fire in nylon, silk or very frilly clothes.
9. Never switch on or switch off electrical appliances on your own.
10. Make sure your hands are dry before you turn on a light.
11. Medicines can be dangerous and bottles can look alike. Make absolutely sure before you take any medicines. Don't take it if you are not sure.
12. Use antiseptic lotion and clean water for washing fresh wounds to remove dust, sand and blood stains.



13. Use antiseptic cream or an antiseptic plaster for ordinary wounds.
14. Bandage deep wounds with a clean bandage cloth after applying medicines and covering it with lint or gauze.

### Things to do

1. Learn to respect other people. This means you show consideration and concern for everyone, old or young.
2. Learn to do any work given to you carefully.
3. Be gentle and kind to other people, whether they are grown-ups or children. Don't be rough.
4. Watch your teacher or another adult giving simple first-aid. Understand why you should do such things. Try to learn these so that you can help others.



### Exercises

1. Answer the following briefly.
  - a. When and where should you cross a road?
  - b. How should you behave in the games field?
  - c. What are the safety rules you should follow in  
i) the classroom ii) the kitchen?
  - d. Why is it dangerous to touch electrical fittings with wet hands? What are the precautions you should take?
  - e. How is an ordinary wound cleaned?



2. Match the following:

- a. An ordinary wound needs just
- b. To work in the kitchen you should wear
- c. Cover a wound with lint
- d. An antiseptic lotion
- e. Learn the rules
- f. Pushing or pulling
- g. Don't use a blade
- h. Take the correct dosage of
- i. Hold a needle by its sharp end
- j. Exercises

for entry of oxygen.  
could cause serious injury.  
  
to give it to another person.  
build a healthy body.  
an antiseptic plaster.  
medicines.  
cotton clothes.  
kills germs.  
to sharpen your pencil.  
before you play a game.



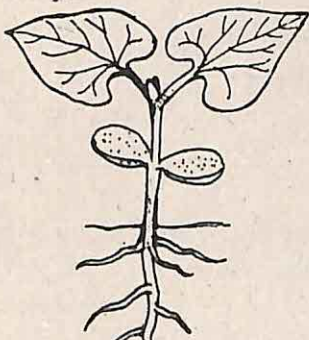
# Test papers

## Test Paper I

1. Answer the following briefly;

- How can you show the differences between living and non-living things? Explain any three.
- Draw a non-green plant and name its parts.
- What are the functions of a green leaf?
- If you keep a balsam plant in a bottle containing water and red ink, what do you think will happen to the transparent stem of the plant? Do this experiment and write the answer.
- What happens to a soaked bean seed if it is left on moist cotton-wool?

2. Name the parts of the following figures:



3. Say whether the following are true or false:

- A germinating seed needs only air. ( )
- Non-green plants cannot make their own food. ( )
- Non-green plants reproduce through spores. ( )
- Mould has an umbrella-shaped body. ( )
- Leaves take in and give out gases through their pores. ( )
- Lion is a food animal. ( )
- Brinjal is a food plant. ( )
- The fur of silver fox is made into coats. ( )
- The horns of reindeer are used for building tents. ( )
- Leaves are able to trap sunlight as they contain green pigments. ( )

4. Give reasons for the following:

- Plants cannot move from place to place because .....
- Animals cannot make their own food because .....
- Living things grow because .....
- Seeds have food stored in them because .....
- A fish has gills, not lungs, because .....



5. Make suitable pairs from the words given below. See the example given.

starch		
shoots	seeds	roots
cotton fibre		
soil	sunlight	living things
spores		clothing
breathing	green pigments	

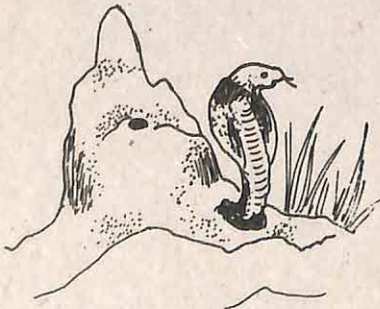
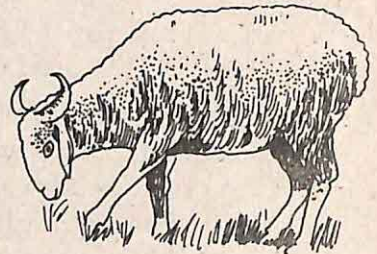
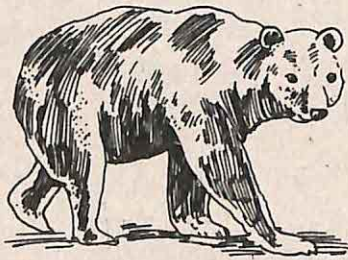
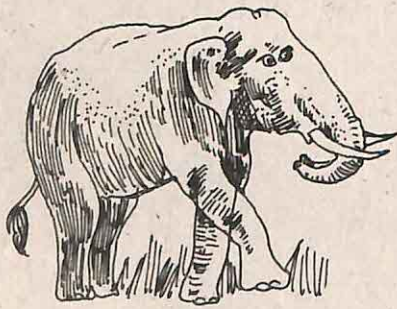
roots — soil

a.  
b.  
c.

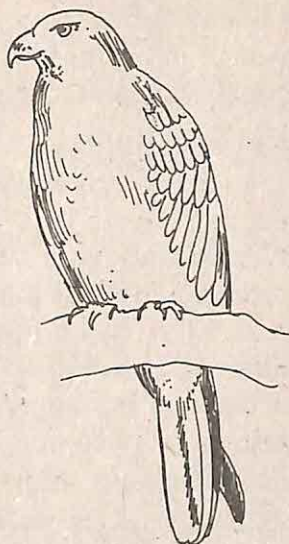
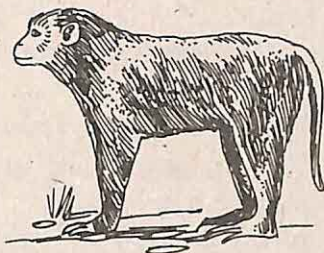
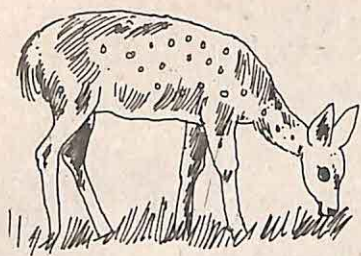
d.  
e.

## Test Paper II

1. Circle each group of animals and name the groups according to their feeding habits. Then name each animal.







2. Match the animal with the type of teeth it has.

- | animal    | nature of teeth                       |
|-----------|---------------------------------------|
| a. cow    | sharp teeth for tearing flesh         |
| b. bird   | sharp front teeth for cutting grass   |
| c. rabbit | all types of teeth found              |
| d. tiger  | strong grinding teeth for cud-chewing |
| e. man    | no teeth                              |

3. Separate the natural homes of animals from their artificial homes from the list given in the box.

kennel		
coop	sty	cave
den	nest	hive
burrow	stable	
honey comb		

natural homes

artificial homes

- |         |         |
|---------|---------|
| a. .... | a. .... |
| b. .... | b. .... |
| c. .... | c. .... |
| d. .... | d. .... |
| e. .... | e. .... |

4. Give a short description for each of the following:

- proboscis
- a leech's mouth
- mouth parts of a mosquito



- d. a warren
- e. nurseries in an ant-hill
- f. the scaly home of an armadillo.

5. Identify the following:

- a. After sucking blood till its stomach is full, this animal does not feed for some time. ....
  - b. These animals move in herds for safety. ....
  - c. These animals feed hurriedly and take shelter in the shade of trees for grinding the food properly. ....
  - d. This animal has a long sticky tongue to swallow its food whole. ....
  - e. The claws of this animal are specially meant for digging the soil. ....
  - f. These insects live in groups or colonies. ....
  - g. This soft-bodied animal has a shell on its back. ....
  - h. This insect makes paper-nests. ....
- 

### Test Paper III

1. Give reasons for the following:

- a. Domestic fowl and pea-fowl can fly only to low roof-tops because .....
- b. Sparrows have short, hard, horny beaks for .....
- c. A hoopoe has a pincer-beak for .....
- d. A duck has webbed toes as it is a .....
- e. A tailorbird has a thin, sharp, curved beak for .....
- f. An ostrich has two heavy toes to .....
- g. Sometimes we only hear the calls of ducks and geese but cannot see them flying because .....
- h. When a bird flies, its tail feathers turn left or right for .....
- i. A bird's bones are hollow to make .....
- j. A crow's nest is a deep cup because .....

2. Give brief answers for the following:

- a. Why do birds collect tiny feathers, cotton-wool, etc. when they build their nests?
- b. Why does a kingfisher have a smelly nest?
- c. When do parent birds become shabby and tired?



- d. Why does a duck have a flat beak?
- e. Why do waders have thin, wide-spreading toes?
3. Write five sentences each about the feeding and nesting habits of the following birds.
  - a. Woodpecker
  - b. Kingfisher
4. Match the following:
 

a. weaverbird	expert swimmer
b. partridge	keep the birds warm
c. parrot	a bird of prey
d. pelican	cradle nest
e. mynah	sings sweet songs
f. down feathers	upper part of the beak moves
g. tailorbird	three strong, horny claws for scratching the mud
h. eagle	shallow nest on the ground
i. fowl	insect eater
j. nightingale	leafy nest

### Test Paper IV

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1. Complete the following:
  - a. Dew is water vapour condensed on objects on the ground such as .....
  - b. When we start a journey from one place in an aeroplane and proceed east .....
  - c. Loam contains a good proportion of .....
  - d. Paddy grows well in clayey soil as its roots .....
  - e. Sandy soils drain off water very quickly as .....
  - f. The sun, wind, moisture in air, clouds and rain make up .....
  - g. Large hailstones are dangerous as .....
  - h. Night and day follow each other in succession as the earth .....
  - i. The earth and the moon reflect light they receive .....
  - j. When boulders roll along the mountain slopes, .....
2. Answer the following briefly:
  - a. What is condensation?



- b. Where does rain water go?
  - c. Why does the sun look small?
  - d. What is top soil?
  - e. Which star pattern do you like best? Why?
3. Write five sentences each for the following:
- a. The sun
  - b. The moon
4. Explain the following terms in one sentence:
- a. Melting
  - b. Evaporation
  - c. Sleet
  - d. Frost
  - e. New moon
  - f. Full moon
  - g. Humus
  - h. Pebbles
5. Say whether the following are true or false.
- a. Change of liquid to solid is called freezing. (     )
  - b. Water vapour is a gas. (     )
  - c. The moon is the satellite of the sun. (     )
  - d. Water-cycle repeats itself year after year. (     )
  - e. Clayey soil cannot retain water. (     )
  - f. Fog is a high cloud. (     )
  - g. Frost crystals form beautiful patterns. (     )
  - h. Due to uneven cooling of the earth mass. mountains, plateaus and valleys were formed. (     )
  - i. Sand is a rich soil. (     )
  - j. Clay particles are very big. (     )
- 

### Test Paper V

1. Write suitable answers for the following:
- a. Make a list of the things necessary for building up a healthy body.
  - b. Why is it dangerous to play rough games?
  - c. Why do we use tools or simple machines for doing work?



- d. In what way can you use your muscular force?  
e. What is energy?  
f. What should you do to dissolve salt in water very quickly?  
g. Why should we not touch an electric switch, plug or wire with a wet hand?
2. Pick out the substances which are soluble in water from the following list:
- 

milk      face powder  
            honey  
chalk      common salt  
jaggery    sugar    varnish    oil

---

3. Tick the necessary items and strike off the unnecessary items for your house, from the following list:
- a. doors and windows
  - b. a heater in the bedroom.
  - c. mosquito nets
  - d. a meat safe
  - e. dark rooms
  - f. facilities for washing and drying clothes
  - g. a bathroom
  - h. a narrow kitchen
  - i. co-operation among the family members
4. a. Tick the food-stuff which are rich in proteins.
- 

cheese      tomato      beans  
            chilli      rice  
            peas      butter

---

- b. Tick the food-stuff which give us energy to do work:
- 

potato      mango      carrot  
turnip      sugarcane      cucumber  
rice      sweet potato

---



c. Tick the green vegetables

---

	pumpkin	radish
	cabbage	
bitter gourd		spinach
	greens	
beans	beetroot	yam

---

5. What would you use to do the following:

- a. draw water from a well
- b. open the lid of a tin
- c. bring a scooter into your verandah
- d. measure the length of a room
- e. pick up a tiny, sharp needle from the ground
- f. tell the time
- g. attract bits of paper with a plastic comb
- h. cover a small open wound
- i. cross a busy road
- j. fill a balloon